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TODAY IS UNDER YOUR CONTROL.

Good days and bad days exist only in your own head—the weather has nothing to do with it. Each day is what you make it for yourself. Bad weather is only an unfortunate opinion. Right now is the only time you can control. Yesterday is a record. Tomorrow is a secret. Today is yours! Is mine!—American Magazine.

Telephone Optimism.

Least affected, if affected adversely at all, by the European war, the American telephone industry will be the first to sense a feeling of better times, according to an Eastern telephone official, who points out that that feeling is already apparent. It is his opinion that the Eurpoean conflict, as it pertains to American finance and business, will not effect a long paralysis here, but merely a brief period of partial suspension pending a readjustment of conditions that was not wholly untimely. The healthful change, according to him, will be the emphasizing of the policy of local financing. There is as much or more good money in the country now than there ever was. He believes the investor will now look less to stock of distant corporations and will be only too glad to use his money in reliable and certainly more tangible local industries. As this is a policy not new to the telephone development, it may be seen that much additional good would accrue to that industry with its more general application.

The feeling of optimism—that there will be plenty of money available to cover natural telephone development and to care for the needs of existing systems—is more and more apparent. In fact, the feeling goes even further, many interests expressing the opinion that there will be funds available for the needs of new telephone organizations. It is pointed out that the war has not had the ill effect upon telephone financing that it has had on the financing of other industrial enterprises, and that this is a further sign of the stability of the business. While the financing of other schemes have either fallen through or been postponed, such projects as the merging of the Ohio telephone companies have every appearance of being carried through to a successful consummation.

Another cause for reassurance among telephone interests at this time is the indication that legislation which, it was feared, was going to prove a great burden, is to be postponed if not entirely quashed. There is every reason to believe that the Rayburn bill which has been pending in a Senate committee for some time will not be taken up at this session. The bill was one of the anti-trust measures and had to do with the stock and bond issues of common carriers. It was the cause of a delegation of telephone men appearing before the Senate committee on interstate commerce and protesting against the measure, as well as of many delegations of railrood men, the bill being especially designed against railroads. As a result of this activity telephone companies were exempted from the provisions of the bill, and now it appears that the bill itself, alone of the various trust measures, will be allowed to go over until the next session.

Perhaps the chief discussion among telephone men at this particular time is that of the condition of the telephone systems abroad. The phase of the question taken up by Samuel Untermeyer attracted wide attention, as it had to do with the necessity of the United States government either owning the telephone systems of the country or having its own emergncy system connected with the post office department for use at war times. The general opinion prevails in the East that in the event of war, the telephone network of the country could be regulated under strict censorship by the government with as good results as if it were under government ownership.

Nowadays and Thenadays

By HERBERT KAUFMAN

One may rent a fine old castle in Gascony, equipped with all the discomforts of the romantic ages, for considerably less than a so so flat in Harlem.

After lifting the veil of mystery from the vale of history, the golden grandeur of the past seems to have been thinly plated in spots.

Distance lends inaccuracy as well as enchantment to the view—a few centuries afar we lose sight of the nuisances which harassed even the lives of princelings. For instance, the kings of France could afford to drape a thousand chambers with tapestries of Gobelin, and couldn't get protection against chilblains nor relief from the snuffles.

Court beauties bought their hand-made laces and velvets by the square yard, but the prettiest mouth in Europe was apt to go ugly for want of a hand-made tooth.

The Renaissance incubated a Da Vinci, a Michelangelo, a Cellini, and a Tintoretto, yet failed to hatch a plumber or a garbage inspector.

People were esthetically superb, and physically miserable. Men were great only in cruelty and art.

Elegance was a veneer laid over natures unspeakably coarse and licentious. A twentieth century coal heaver wouldn't tolerate the table manners and private habits of a doubleted dandy. Your laundress enjoys more substantial comforts than Lucretia Borgia commanded.

Recently erected tenements are furnished with accessories beyond the conception of ancient monarchs. To secure service, equivalent to that piped and wired into a workingman's home, once entailed the labor of a retinue of domestics.

The vast establishments, so frequently envied by the superficial readers of chronicles, were not evidence of unfettered extravagance, but indispensable for the procurement of ordinary ease. Half a hundred scullions, lackeys, and pages were less efficient than a gas range, an electric current, a telephone, a letter box, and a dumb waiter.

Queen Elizabeth panted through muggy summer nights without ice water—Marie Antoinette never saw an elevator, nor a motor car. The ingenuity of all her husband's ministers could not protect her delicate nostrils from the gutter stenches as she jolted over the rough cobbles of Paris in a golden but iron-tired coach.

The penny of a laborer has for many purposes outgrown the pistole of a monarch.

Aladdin is dead, but the Slave of the Lamp survives as the Slave of the Button—now at the service of the universe, doing all sorts of chores, from heating a sad iron to running a dynamo.

If we could find any wizard or djins nobody would hire them—the inventors have given us a mechanical outfit that makes 'em look like thirty cents. Besides, there are antiseptic surgery, and democracy—each of them has cut out a lot of things which once made existence miserable. And we might mention such miracles as free education, and open plumbing, and anesthesia, and newspapers, and pins.

Why, anybody nowadays has the laugh on everybody thenadays. We're working out our problems swiftly and symmetrically. We're always going ahead.

If occasionally a beneficent readjustment seems to entail an unnecessarily harsh experience to an individual or a class—what of it? We can't built without some waste.

Suffering and disappointment are economic chips and sawdust—still unavoidable, yet only because of ignorance—but every year we know more, and so every year the human rubbish heap grows less.

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Inconsistencies in American Telephone Practice

A Discussion of Methods of and Practices in the Plant, Operating and Executive Departments of Telephone Companies Which are not Economical When Viewed from a Combined Engineering and Commercial Standpoint—Toll Line Construction—First Installment

By Constructive Critic

All branches of engineering have their inconsistencies in practice, telephony doubtless having its full quota.

What is meant by inconsistencies herein, is the employment of methods and practices uneconomic from a combined engineering and commercial standpoint. We find the inconsistencies not only in the plant, but in the operative and executive departments as well. A few of these as appearing to the writer, will be mentioned—not so much with the spirit of fault-finding in the specific cases related, as with the object of bringing such practices to general attention for consideration solely upon the merits as they may appear to each reader.

Before "running amuck," the writer will state to the men in the construction department who may read this, that he once was a groundman, and later became a lineman. That was the good old days when a self-respecting lineman would disdain using a safety belt. To the station and maintenance men, the writer will state that he, too, has "hiked" over the hills and through the "jungles" with a tool and supply kit—and the 30-pound test set furnished him—many times during a storm. To the switchboard men, the writer says that he has "shot" trouble in a central office and did actually set up a 100-line magneto switchboard without assistance. To the traffic men, he says, that he used to be night telephone operator in New York state some 25 years ago. To the engineers, he will confess that he long contemplated taking a correspondence course in telephone engineering—but somehow kept putting it off. To the executives, he states that he himself has a well-upholstered chair that tilts back and has a swivel.

So I really have been initiated into the fraternity and am one of you, from the man with the digging bar to "that dub in the front office." I will endeavor not to overlook any of my brothers in what I have to say. If I should become overcensorious and ruthlessly clash with any of the sacret tenets of the profession, kindly accept my most sincere apology, offered in advance. I plead guilty with you, brothers, to each and every count, but I am making an effort to reform.

Investment of Telephone Companies.

The telephone operating company's prime object being a really serious one, the smallest investment in plant that will make merchantable service—and that quality varies in every community as does the quality and kind of goods demanded of stores—is all that is necessary. Anything more is not justified if we are to make an ultimate commercial success of the property, notwithstanding more or less sentimental arguments that may be adduced in opposition to this contention.

Telephone properties have been over-engineered, as they have been under-engineered. Engineers, by reason of their training and sphere of endeavor, have, as a class, been idealists rather than commercialists. They have been good builders rather than good operators. Their ambitions have run to the superlative in scientific and structural achievement, seemingly thoughtless of the objects of it all. They have often set and maintained a higher standard of service than was demanded by the exigencies of the situation.

We have observed over-zealous factory engineers and superintendents, we have urged expansion in grounds, buildings and equipment at great outlay as the only way to increase and cheapen output, instead of devising more conservative and less pretentious ways of improving the efficiency and increasing the volume of output with existing space and machinery. Just so, we have innumerable instances of building new pole lines or stringing additional circuits when what was really needed was more efficient handling of traffic on existing circuits and leads. We all know of instances where another year or two of service, representing a considerable sum in interest and depreciation, not to mention the expense and trouble of financing, could have been eked out of a rather disreputable looking toll or local exchange lead by slight repairs. We likewise know of instances where serviceable equipment has been displaced by a newer fad, out of pride perhaps superinduced by a good line of sales talk from the factory's representative, rather than from business prudence.

Ultimate Profit Usually Not Considered by Engineers.

I do not mean to say that the engineer (traffic, equipment, or construction) is always heedless of revenue and the commercial and traffic aspects of the situation, when recommending and specifying in general, but I do say it is very common for him to stop calculating when he can satisfy himself that the investment or improvement contemplated will have an estimated earning sufficient to carry bond interest, taxes and estimated depreciation—the latter two often being ignored. The element of ultimate profit does not usually concern him much, nor does the procuring of the necessary funds. The latter is taken as a matter of fact. He simply justifies the expenditure and considers that a great stroke of business has been accomplished if his representations were presented artfully enough to have convinced the man higher up with the blue pencil, that the improvement recommended was really critically urgent and vital.

The man higher up with the blue pencil is the villain in all dream-fancies of the engineer. How to get past this "bulldog of the treasury" with his "tightwad" proclivities is a constant problem. Our engineer's qualms of conscience come after he falls heir to a blue pencil and has had his name painted on the door to the front office. Then is when he is brought sternly to a realization that widows and orphans (page 14 of leaflet issued by Theo. N. Vail, president, A. T. & T. Co., regarding mutual relations and interests of the Bell system and the public. It states that over one-half the shareholders of this company are women) holding the stock and bonds, must be provided for and that the object back of the conception of his company, as set forth in its articles of incorporation, least of all, was the exhibition of engineering triumphs to awe-gaping visitors. He then realizes, too, that there is some one still higher up, back somewhere, who has a blue pencil and perhaps a perpetual grouch also.

I tell you, having a hollow title is no sweet narcotic-induced vision! No! It isn't at all like it looks to the office boy, nor to the man wearing a 46-inch belt, as he nervously fumbles a size 6¼ cap, when in "on the carpet."

Toll Line Construction.

For convenience, the discussion will be taken up under various divisions.

Specifications of toll line construction which I have read,

would seem to contemplate leads par excellence, and I want to compliment the many construction men, engineers and executives on the fidelity with which they have carried out the letter of specifications in line construction observed in various parts of the United States. Much of this work now stands as a monument and testimonial to the ability of present-day engineers to build well when ample funds to draw from are provided. It likewise stands as a testimonial and monument to ability to build too well in instances coming to my notice. This last statement seems paradoxical, but let me explain. It is very natural for the construction engineer to want to build leads that will positively withstand the stress of weather and that will forstall engineering criticism, losing sight of the purely commercial considerations of the case.

A Beautifully Constructed Toll Line.

With the trend of the times to outdo previous accomplishments, we often find expensive, tall toll leads where shorter, if less majestic, poles would answer every operating and commercial requirement. I have in mind a lead built seven years ago between two cities, 160 miles apart, where the poles were as carefully graded as if a railroad train were to be run over the wires. The poles are 8-in. to 10-in. tops, 30 feet long on level stretches, with poles up to 80 feet in length in gulleys and depressions. The country being uneven, the average length of poles is about 35 feet.

Every angle pole on this lead, regardless of how slight the deflection, is guyed and double-armed. In many instances the guys cross roads to a stub and anchor and are slack, showing their utter uselessness. In addition to this, on the heavy angles, the top of the pole is guyed or braced to the butt of the first pole each way—and these braces are likewise slack. This line averages an angle to every eight poles. Poles are spaced 132 feet on tangents and 50 to 120 feet at angles. Transportation poles are placed on "the spot," often necessitating the extra pole to avoid a "longer-than-standard" span.

At the present time there are three circuits strung over most of the distance, and five circuits over the rest of the distance, all on one ten-pin cross arm attached by two lag bolts. Anchored storm guys are placed every 20 poles on the tangent runs. This lead is in the South where severe sleet weather is never encountered. It's a beautiful, graceful piece of construction that any engineer or foreman might be proud of, but the building of it took all the procurable funds of the company, so no feeders could be constructed to it.

A hard-headed railroad builder would have gotten a less imposing lead through, that could have been subsequently strengthened from its own earnings. He would have also used the shortest possible poles consistent with the probable demands. Not only do shorter poles cost less per foot and in the aggregate, but the delivering, to the hole, of poles of excessive lengths, particularly if the country is rough and inaccessible, is very much greater per pole. The erecting of short poles is less expensive than long ones and the stringing of wires over them costs less per mile of wire. The shorter poles are more stable, due to the fact that there is less leverage to strain the butt of the pole at the ground line.

The hard-headed railroad man would also have left off the heavy expensive guying at small deflections until more circuits were to be strung, or until the poles deteriorated to the point of requiring all angles to be guyed or braced. In this way, he would have saved the interest, taxes, and depreciation on, and the capital outlay of a considerable sum over a period of years, possibly using these funds in the construction of feeders. In order to insure the greatest possible stability and at the same time obviate all possible bracing and guying, this hard-headed railroad builder would, no doubt, have seen that the poles were carefully graded, using the heavier poles at angles, and "raking" them well. If necessary, he would have placed pole orders so a sufficient number of extra heavy or extra large poles would have been included in the shipments, even at an additional cost. The smaller poles would have been used in the less exposed places, such as interspersing them in straightway runs.

It appears that we, in our zeal, often become unmindful that our beautiful pole construction only lasts 10 to 15 years—many poles not lasting that long. It is, therefore, pertinent to seriously ask ourselves, if, after all, the aesthetic phase in construction does exert a very potent influence in inducing larger gross or net revenues, and if contemplating the superior handiwork simply, will bring much cheer to holders of stock certificates or go far in placating holders of defaulted bond coupons?

The latter was brought home to me in most forcible and unusual way some six years ago. An Independent long distance telephone company in the Middle West had just finished a new lead some hundred miles in length, and to properly impress its prospective connecting local exchange operators, a sight-seeing trip was made with a number of them over a portion of the lead. It so happened that in the crowd was one of the original pioneers in the field of Independent telephony—one of the very first men to hang out the Shield in this country, and who has not to this day hauled it down. In justice to this dauntless individual, I want to say that his territory has been impregnable to the onslaughts of the Bell company these 20 odd years. He has been monarch of his territory since the beginning, and his subscribers would stand by him now to the last ditch. Further, this man is one of the very few men of my acquaintance who has really made any considerable sum of money out of the telephone operating business and actually "shook hands with it."

Now, to get to the point: In this operator's central office is an old style magneto switchboard. His lines traversing the country 'round are notoriously dilapidated as far as appearances go, but nearly always in order. During all the effusions by his brother "magnates" over the fine looking lead, this individual wore a smirk. When the triumphal trip was over, the general manager of the long distance company, who knew the physical state of the aforesaid operator's system, went over to him and asked, in a very self-satisfied sort of manner, what he thought of the construction. This was the reply, after a moment's reflection:

"Beautiful, beautiful! But I have been wondering if those large, tall poles and slack hawser guys will help so very much toward paying dividends?"

As a matter of fact and record, our conservative's cogitations were about right, for the company owning that toll lead has never paid one dividend.

There is perhaps no phase of outside telephone construction work quite as inconsistent as the usual practices in connection with toll line building. In place of sending out a competent locating engineer and transit men to carefully survey and stake each pole over the proposed route, after knowing the traffic requirements fully based upon a careful traffic survey; to obtain rights-of-way, tree trimming privileges and to investigate possible road changes—a merely tentative route is usually chosen and the gang sent into the field with a few carloads of poles and an assorted supply of material consigned to convenient sidings, with orders to build the lead.

Toll Line Construction Foreman's Duties.

I do not know of an instance, though obviously there may be many, where preliminary plans include such provisions and data as having all rights-of-way and trimming rights secured, every pole location staked and a record made of the height and size of each pole noted in instructions; also the kind and nature of guying and bracing, so that the foreman prosecuting the work would be charged with nothing be-

yond reading the instructions and notions and looking after the most efficient handling of his men. He would know that every car of poles contained poles best suited to the conditions of the spot upon which each is to be erected, both as to height and size.

The matter of improvising construction and being obliged to make terms with property owners for rights-of-way and for trimming trees, or to build over or around, should have been settled before his coming on the ground and so noted in his instructions. Further than this, the preliminary survey should include proper segregation of shipments, to insure the least haulage.

The usual plans make it necessary to hastily go into the market and buy such poles as may be offered. Thus green summer-cut poles are often the only kind available for immediate delivery. These, as we know, do not last nearly so long, and due to greater weight, are more expensive in freight and team transportation—not to mention erection. Most companies use some kind of preservative but, unless the poles are thoroughly dry when the preservative is applied, it is next to useless and is therefore a waste of money. When it is definitely known months ahead, dry, well seasoned, winter-cut poles may be obtained—each car to exact specifications—and the preservative applied by careful, competent men in the pole yard before loading. An assortment of extra poles may be included in orders, for contingencies, and if not used, stored along the route to be handy for emergencies.

It is not reasonable to expect satisfactory results of a foreman bending his energies to get the most work accomplished per man, under the stress of thinking up a way to couch his daily report so it will look good when it is spread out on the mahogany desk of the dignitary up at headquarters. At the same time the foreman is usually obliged to use deliberate, correct judgment in extraordinary construction cases that should have been anticipated and definitely worked out long before—better perhaps by this foreman in company with the locating engineer.

(*To be continued.*)

California Commission's Rules to Minimize Induction

Issues an Order Embodying the Recommendations of the Joint Committee on Inductive Interference Which Body, After About 18 Months of Field Work Has Issued A Voluminous Report—Commission's Order in Full With Its Definitions of Terms and Rules

The California Railroad Commission has issued an order embodying the recommendation of the joint committee on inductive interference which, after an exhaustive investigation, submitted to the commission a voluminous report covering several hundred pages with a mass of diagrams, photographs and mathematical computations. This joint committee was made up of the chief engineers of the principle telephone, telegraph, electric and electric railway companies and the engineers of the California Railroad Commission. The investigations started in December, 1912, and have been actively carried on in the field since that time. The report of the commission is in full as follows:

It is hereby ordered that the following rules to govern the construction and operation of power and communication circuits which are, or are proposed to be, so located as to create a parallel as hereinafter defined, be and the same are hereby adopted, effective August 20, 1914.

Definitions.

The following definitions are given of certain technical terms employed:

Power Circuit. The term "power circuit" includes any overhead constant potential alternating current power transmission or distribution circuit or electrically connected network which has a voltage of 5,000 volts or more between any two conductors or of 3,000 volts or more between any conductor and ground.

Communication Circuit. The term "communication circuit" includes any overhead, open wire telephone, telegraph or signaling circuit which is used in the service of the public.

Telephone Circuit. The term "telephone circuit" includes any interchange metallic telephone circuit, and therefore excludes subscribers' circuits. This term also includes any metallic telephone circuit operated by any railroad or other company for dispatching purposes or for public use between separate communities.

Line. The term "line" means any circuit or aggregation of circuits carried on poles or towers.

Parallel or Parallelism. The terms "parallel" and "parallelism" refer to cases where a power line and a communication line follow substantially the same course, or are otherwise in proximity for a sufficient distance, so that the power circuit is liable to create inductive interference in the communication circuits.

Residual Current. The term "residual current" denotes the vector sum of the currents in the several conductors of a power circuit.

Residual Voltage. The term "residual voltage" denotes the vector sum of the voltages to ground of the several conductors of a power circuit.

Transposition. The term "transposition" denotes the interchange of position of the several conductors of a circuit.

The rules promulgated by the commission are as follows:

1. Avoidance of Parallelism.

Every reasonable effort shall be made to avoid new parallelism. The party proposing to build a new communication or power line which will create a parallel, or generally to reconstruct an existing line involved in a parallel, shall give due notice (at least 30 days wherever possible) of its intention to the other party, including detailed information as to the location and character of the proposed line. If a plan can be devised and agreed upon by the two parties for maintaining an adequate separation between the two classes of lines so as to avoid interference, this shall be done. In case it is impracticable to secure adequate separation between a power line and a communication line, parallelism will be permitted subject to the conditions set forth in II.

II. Condition Under Which Parallelism Will be Permitted.

(a) *Minimum Horizontal Separation.* The minimum horizontal separation between the power line and communication line shall be equal to the height of the taller line. The only exceptions to this provision are angle crossings and other unavoidable cases of close proximity, and in all such cases the power line shall be kept above the communication line and constructed in conformity with the National Electric Light Association's specifications for overhead crossings or other approved equivalent which may be agreed upon by both companies.

(b) *Balance of Power System.* The power company shall exercise due diligence to keep the currents in, and the voltages to ground of, the conductors of any power circuit involved in a parallel as closely balanced as practicable. In all cases where

telephone circuits are involved, special consideration shall be given to the prevention or elimination of harmonics in the residual current and in the residual voltage.

(c) *Limitation of Residual Currents and Voltages.* Pending additional rules on specific means other than those given herein, the parties concerned shall endeavor to agree upon the means to be employed for the prevention or limitation of residual currents and voltages, and in the event of disagreement the matter shall be referred to the Railroad Commission of the State of California.

(d) *Transpositions Inside Limits of Parallel.* An adequate system of transpositions shall be installed in the power circuit (or circuits), and in the communication circuit (or circuits), provided the latter is metallic. When both circuits are transposed the transpositions in both the communication and power circuits shall be located with due regard to each other.

Every reasonable effort shall be made by both parties concerned to fix the limits of the parallel and the location of crossings, branch lines and connected apparatus so as to facilitate the application of an effective transposition scheme.

In the case of a parallel between a power line and a telephone line the company owning or operating the telephone line involved shall have the right to specify the number, type (in respect to electrical characteristics) and location of the transpositions in the power circuit subject to the following limitations:

(1) For power circuits of 50,000 volts or over the average distance between successive transpositions shall not be required to be less than 1 mile, and the minimum distance between any two successive transpositions shall not be required to be less than two-thirds of a mile.

(2) For power circuits of less than 50,000 volts the distance between successive transpositions shall not be required to be less than one-sixth mile.

The transposition system of the telephone circuits shall be modified where necessary in order that the power and telephone circuits shall be, as nearly as practicable, mutually non-inductive.

For short parallels less than six miles in length (or short sections of longer parallels which have to be treated independently because of abrupt change in conditions) with power circuits of 50,000 volts or over, where it is impracticable to obtain an adequate balance by the location of transpositions in accordance with the limit specified above, the company owning or operating the telephone line involved shall have the right to specify the number, type and location of transpositions, provided the distance specified between successive transpositions is not less than one-half mile.

When necessary (owing to variations in lengths of telephone transposition sections) in order to secure an adequate balance, a reduction of 10 per cent. in the limiting distance between successive power circuit transpositions as given above, shall be allowed.

In the case of a parallel between a power line and a telegraph line or other grounded communication circuit the location of the transpositions in the power line shall be with due regard to the limits of the parallel in order to form as nearly as practicable a balanced system. The location and type of such transposition shall be as specified by the communication company, subject to the condition that the transpositions in the power circuit may not be required to be less than 1 mile apart.

In no case shall the power company be required to relocate poles or towers for the transpositions.

The parties concerned in any proposed parallel shall endeavor to agree upon a transposition scheme for such parallel in accordance with the above. In the event of a disagreement the matter shall be referred to the Railroad Commission of the State of California.

(e) *Transpositions Outside Limits of Parallel.* In addition to transpositions within the limits of a parallel, as provided in "d" hereof, each new power circuit isolated from ground (or extensions of such existing circuit) which is constructed subsequent to the date when these rules become effective, shall be transposed throughout its entire length in such manner as to balance the electrostatic capacities to earth of its several conductors, so as to avoid inequalities among the voltages to earth of the several conductors, which would create inductive interference. Such transpositions shall not be more than 8 miles apart, provided, however, that circuits less than 3 miles in length are not required to be transposed until they are extended to a greater length; except that extensions or spurs from existing lines the electrostatic capacities to earth of whose conductors are balanced shall be so constructed as not to change materially the balance of the existing lines to which they are connected.

(f) *Uniformity of Parallel.* To facilitate the application of effective transpositions, both parties shall endeavor to maintain uniform separation, uniform arrangement of conductors and uniform relative location of the two classes of circuits within the limits of a parallel. However, when it is feasible to secure a substantial increase of separation between the two lines for a considerable portion of a parallel this shall be done, as such an increase of separation is of more benefit than uniformity.

(g) *Transformer Connections.* (1) On any power circuit involved in a parallel no grounded single phase or grounded open-star transformer connections shall be employed.* On a power circuit involved in a parallel no star-connected transformers or autotransformers with grounded neutral shall be employed unless delta-connected secondary or tertiary windings or other equivalent means are used of suppressing the third harmonic components of the residual voltages and currents introduced by the transformers. (3) Where single phase loads are connected to a polyphase power circuit involved in a parallel the power company shall endeavor to arrange successive connections of this type so as to equalize the loads upon the several phases. (4) On a three phase circuit involved in a parallel the power company shall use, wherever practicable, a closed-delta connection in preference to an open-delta connection, and where the latter is employed an effort shall be made to distribute such connections equally upon the several phases.

(h) *Switch Equipment.* A power circuit involved in a parallel shall be equipped, between the source of supply and the parallel, with oil switches, all poles of which shall be mechanically interconnected for simultaneous action. With the exception of stations where an operator is constantly on duty, these switches shall be rendered automatic for short circuits, grounds and abnormal neutral currents.

(i) *Switching.* All switching on all parts of a system connected to a circuit involved in a parallel which causes harmful transient disturbances in communication circuits shall be done by means of oil switches, all poles of which are mechanically interconnected for simultaneous operation.

(j) *Use of Air Switches.* The use of air switches on a power circuit involved in a parallel is prohibited except for purposes of isolating sections of dead line or for disconnecting transformers under no load. This applies to the entire power system any circuit of which is involved in a parallel, unless such switching is so remote as not to cause harmful transient disturbances in the communication circuits.

(k) *Abnormal Condition.* A power circuit involved in a parallel shall not be operated at any time with an open-grounded or short circuited line wire or wires or transformer winding.

(l) *Devices for Indicating Abnormal Conditions on Sys-*

*This does not apply to railroads operating alternating-current trolleys with ground return, which are covered by V.

tems Isolated from Ground. If a power circuit involved in a parallel is electrically isolated from ground, reliable indicating devices shall be installed at its source of supply to inform the operator immediately of abnormal conditions, such as grounds, and wherever possible open circuits which have not operated automatic switches. Upon indication of trouble by such devices, the operator shall immediately open the oil switches and proceed in the manner outlined in "m."

(m) *Procedure Under Abnormal Conditions.* In case of the opening of an oil switch owing to an abnormal condition in a power circuit involved in a parallel, or any circuit supplying or supplied by the same, such switch may be closed once. If opened a second time owing to the continuance of the fault of abnormal condition, said switch shall not be closed again until the line has been sectionalized. The fault may then be located by energizing sections of line, provided that further sectionalization of the line be done in such sequence as to cause the minimum disturbance to parallel communication circuits, and provided further that where practicable the faulty section of line shall be energized but once in this process of sectionalization, where the fault exists within or beyond the parallel, until such fault is remedied.

(n) *Ammeters in Neutral Ground Connections.* Wherever a neutral ground connection is employed on a circuit involved in a parallel, an ammeter suitable for measuring as accurately as practicable the current in the neutral under normal operating conditions shall be installed in all neutral connections at the main generating station and substations on the power system electrically connected to the circuit involved in the parallel. The power company shall maintain a record of hourly measurements of the neutral current at all such points.

(o) *Charging Electrolytic Lightning Arresters.* Where a power system is equipped with electrolytic lightning arresters so charged as to cause inductive interference in communication circuits, the method of charging the arresters shall be modified to eliminate the disturbances as far as possible. The charging of such lightning arresters shall be done at such time as to give the minimum liability of interference with communication circuit operation, preferably between the hours of 2 a. m. and 4 a. m.

(p) *Wave Form of Rotating Machines.* The power company shall make every effort to obtain generators and synchronous motors for use on all parts of the system, giving, as nearly as reasonably possible, pure sine waves of voltage at fundamental frequency. In no case shall the deviation from a pure sine wave exceed the limit set forth in the Standardization Rules of the American Institute of Electrical Engineers.

(q) *Exciting Current of Transformers.* In order that the wave shapes of voltage and current may be distorted as little as practicable by transformers, the main line transformers employed on circuits involved in a parallel and on future extensions of such circuits shall have an exciting current as low as is consistent with good practice, and in no case shall the exciting current at rated voltage exceed 10 per cent. of the full load current. Such transformers shall not be operated at more than 10 per cent. above their rated voltage.

III. Provisions Applying to Existing Parallels.

The following sections of II shall apply also to power circuits involved in existing parallels: b, i, j, k, l, m, o, p, and q. Also g-3 and g-4 shall apply to existing parallels to the extent that transformers added hereafter shall be connected as provided in said rules.

IV. Waiver of Conditions by Communication Company.

At the option of the company operating the communication circuit or circuits any of the provisions of II and III may be waived provided that such waiver does not increase the hazard.

V. Parallelism with Alternating Current Railways.

It is recognized that railroads operating alternating current trolleys with ground return create serious inductive interference with parallel communication circuits. In the present state of the art no means for completely overcoming inductive interference from such parallels is known, hence they are to be avoided if possible, and where unavoidable the responsibilities arising therefrom must be settled by mutual agreement, or in case of inability to agree the matter shall be referred to the Railroad Commission of the State of California.

VI. Applicability to Past and Future Construction.

These rules shall apply to all future construction in this state of the character herein indicated and to all construction now existing, provided that if any party desires to make a departure from these rules as to construction now existing such party may file his written petition with the railroad commission, whereupon the commission will take such action as may seem to it proper.

VII. Rules Subject to Laws and Orders of Commission.

These rules are to apply in all cases where they are not in conflict with any law of this state or order of this commission now or hereafter in effect. In case of conflict, where these rules add to the requirement of any law of this state or order of this commission, these rules shall prevail, otherwise not.

Convention of Indiana Independent Telephone Association.

The program of the Eighth Annual Convention of the Indiana Independent Telephone Association, to be held at Claypool Hotel, Indianapolis, Ind., on September 16 and 17, which was published in last week's issue of Telephony, has been issued by the association in booklet form. It is accompanied by 20 pages of advertising by Independent telephone manufacturers and supply companies. Indications point to a well attended and successful convention.

Indiana Coal Company to Install Concrete Poles.

The Richmond Home Telephone Co., of Richmond, Ind., lost, speaking in round numbers, $10,000 at one time last year and $5,000 at another, as a result of sleet storms. The company is now making every fifth or sixth pole of concrete, having become satisfied, after some tests, that the solid poles so placed will be enough to take the strain of a heavy load of sleet off the wooden poles, and prevent a mile or two of line going out at one time.

Deadbeat Losses Offset by Overpayments at Pay Stations.

Harry Allen, manager of the Central Union Telephone Co., at Dayton, Ohio, is quoted as stating that the losses of the company at pay stations due to persons using slugs of lead and iron instead of nickels and dimes are offset by the overpayments made by persons who are in a hurry and use a coin of larger denomination than necessary rather than stop to get it changed.

P. B. X. Heroine Rewarded.

Alice M. Davis, a P. B. X. operator of Manchester, N. H., was presented with a gold watch by the John R. Varich Co., for the bravery she displayed at the time of the Manchester fire. Miss Davis was a telephone operator in the Varich store where the fire started, and stuck to her post until the fire and police departments had been notified and every one in the building told of the fire.

Consolidation at Billings, Mont.

The Mountain States Telephone & Telegraph Co. has announced that a consolidation of the two telephone systems in Billings, Mont., will be effected before November 1, thus doing away with the dual facilities and service in that city.

Labor Day

A September Institution—What the Telephone Map Shows

By J. C. Kelsey

Labor Day, the commencement day of a new working year. Once a day of mighty parades, today a day of quiet recreation. The parade no longer exists, because the conditions demanding the parade have passed away in the process of our economic evolution.

The parade once had a peculiar significance. It was merely an annual mobilization of strength. The idea was to impress upon the public and conflicting labor forces that there was great irresistible strength, which could carry everything before its onrush. It was a time when one organization disputed the right of the other to engage in certain work.

After all, selfishness was the great, unredeeming element.

So sharp did confliction or competition exist between labor forces that slugger cars became the rage. A few iron-handed men, armed with automatic guns, hidden in the recesses of a fast and unnumbered automobile, would swoop down upon men at work. And the opposing union would have to stop for the funerals.

It was a case of competition aggravated, which was really civil war. War between naturally hostile forces is more or less justifiable. But in civil war, there is no justification.

Likewise, competition between great business forces is justifiable, but between fundamentally friendly forces, there can be no excuse for it.

Look at our Civil War. Two areas fundamentally friendly, engaged in civil war. Lives were lost, and you are only too familiar with the empty-sleeved men who struggled ever afterward to make a living in your town. Property was destroyed, fortunes were ruined and to no purpose.

Our Revolutionary War was somewhat different. It was a necessity. The colonies were confident of being able to rule themselves. The destruction of lives and property had great justification. This was a case of win or be forever enslaved.

There will always be a conflict between labor and capital. They are natural enemies, as far as the popular conception goes. Yet there is a chance some day that these institutions may meet on a common ground.

But for labor unions to fight and destroy one another, and at the same time discommode the public and capital as well—that is admittedly wrong.

In our telephone business, there has been war. It has so happened that the public did not suffer from its effects. Yet the public may be considered the natural hostile force of a telephone company.

Whether your telephone company is Independent or Bell, you have the public, with its sensitive nerves, lined up against you.

The telephone is a peculiarly vexatious thing. It will work nicely for a time. Then, in a critical moment, it may balk and transform a civilized man into an aboriginal mood in a moment.

No doubt many a judge, after studying the merits of a telephone lawsuit all night, has come smilingly down to breakfast, fully decided to give the telephone company its fullest rights. He uses the telephone—an impudent operator, perhaps, a failure of the called party to answer, perchance a busy line—and the judge forgets his decision. He hurries down town, and literally annihilates the telephone company.

All lawsuits should have been settled before the telephone was invented—if telephone companies ever expect full justice.

Naturally, fundamentally, and all, the telephone business is ever in a state of mobilization, as far as the public is concerned.

It must ever be ready for defense. It makes no difference whether one, two or three telephone companies serve that same public. Each and all have the same problems to face.

Whatever warfare there is existing between these telephone companies, may reasonably be called civil war. It is the act of destroying each other for no actual gain, no gratitude or appreciation from either stockholder or public.

If one, two or three companies fall from exhaustion, the public smiles complacently and asks a second, third or fourth company to come in. It will be ever thus.

There has been war in telephone circles for many years. It took years to finally find out the true inwardness of things. It took time for telephone men to find out what the general telephone strategy was.

We had real civil war. Money was spent for countless destructions.

Printers' ink was used by the tub. Every man with a dollar was circularized and taught that Independent telephony was a failure. And each man in America was taught that the Bell interests planned to gobble up everything—that we were to return to telephone slavery or monopoly.

The Bell interests preached the doctrine of universal ownership of telephones. They impugned the perfection of Independent apparatus. They gave the impression that their policy was war to the death—extermination of every enemy of the Bell Koran.

Every expression of their advertising seemed to indicate that the day was not far away when an Independent telephone was to be found only in a museum.

Bitter indeed was the feeling. Telephone companies had to resort to parades—large, exhaustive exhibits of their power. Pirate cars were not scorned. There seemed to be nothing too disreputable to use. Cables were cut, and interrupted service was not an unusual thing.

It was really civil war. Two companies fundamentally friendly and naturally allied against a common foe, the public—gave free service, constructed useless exchanges, and built miles of useless wire.

It was a case of misunderstanding. It must have been.

Have you not seen the late full page advertisement of the Bell interests in the magazines? Their latest full page advertisement is entitled, "What the Telephone War Shows."

It struck me as the first real instructive, constructive and educational public advertisement we have ever seen. It clears away the misunderstanding of universal service. It drives away the idea that they are seeking monopoly. It proves that the Bell company has learned its economic lesson, and that at no future time can any official ignore its expensive lesson.

It shows, for the first time, an admission that we have been engaged in civil war—and not with a foreign enemy.

The advertisement shows a map with exchange locations dotted over it. How thickly they show in Iowa, Illinois, Indiana and Ohio—the storm center of telephone war. How well they show in Pennsylvania, Michigan, Missouri, Kansas, Texas and California.

Surprisingly well does it show telephone development all over our country.

Beneath the map are pyramids. Each pyramid indicates the number of exchanges.

Here is the language of the advertisement: "The pyramids show that only a minority of the exchanges are Bell-owned, and that the greater majority of the exchanges are owned by Independent companies."

"Over 8,000 different telephone companies have already connected their exchanges to provide universal service for the whole country."

So it comes to pass that it is publicly admitted that Independent telephony is a part and parcel of the telephone business.

How long the New England influences combatted our right to engage in telephone work! What millions were spent for an idea. What a battle the thousands of Independent exchanges fought to make the financial world admit of their belligerency.

The pyramids indicate that the labor of years of effort has had the following results:

The Bell company, with assets of a billion dollars, own about one third of all the telephone exchanges in the United States.

Think of that! 32.7 per cent. after all these years of conflict and unlimited expenditure! Does it not tell you something? Does it not tell you that your telephone exchange has a place on the world's financial map?

True it is that the Bell's 32.7 per cent. represents five million telephones. And if you had your choice, you would prefer the financial responsibility of your own company to that of the Bell's.

The Bell company officials, in answer to any claim that they are aggressive, will freely admit that they would consider it Paradise if the number of telephones would stand still—to give them a chance to catch their breath.

The need of New York, Chicago and other large cities is enough to keep the biggest financial organization in the world busy. Every year these places exceed their expected requirements of money. In other words, the Bell company has all it can handle in supplying telephones to these 32.7 per cent. of this country's exchanges.

Of this 32.7 per cent. of Bell exchanges we have a division. 23.5 per cent. of the whole, indicates Bell-owned exchanges where no competition exists; 9.2 per cent. is the figure which shows the number of localities served by two companies. This is something for you to think about.

Less than 10 per cent. is the proportion where telephone competition exists. And let us ask how much of this 10 per cent. is engaged in fruitless war?

In the larger cities where competition exists, each competing company keeps growing. Strange to say they do not greatly conflict.

A Southern city of 85,000 had 16,000 Bell subscribers. The newer competing company soon found 5,000 subscribers who never had a Bell telephone.

We are learning fast that we can have competition without war, without duplication, and without waste. The only crime which can be charged to competition is waste. If that does not exist, then no other complaint can be lodged.

But 9.2 per cent. is a startling figure—and one that admits of little dispute. It shows that Independent telephone men generally have gone on quietly—having lost all fear of invasion—and living in productive peace. 76.5 per cent. of the localities in the United States have Independent exchanges.

Deducting 9.2 per cent. for competing localities, we learn that 67.3 per cent. of the telephone exchanges of our companies serve localities which have no competition at all.

Think of that, Independent telephone men, especially you who may be discouraged! 67.3 per cent. of the switchboards of our United States are exchange occupants of their territory.

A part of that 67.3 per cent. do not connect with the Bell company at all. These Independent exchanges which do not connect with the Bell, and still in exclusive control, amount to 10.5 per cent. The other 56.8 per cent. does connect with the Bell company.

I will always remember the Schloesser incident at the 1903 convention.

It seems that the business men of Gibson City, Ill., demanded connection with Chicago. So Mr. Schloesser finally concluded an agreement which made him a Bell sublicensee.

The association in session stormily descended on Schloesser and threw him out bodily. His only defense was that he would break his Bell connection when the Independents built lines to him.

As you know, they never built lines to him, simply because it was nobody's business to build lines to him.

Independent telephony was a local issue. Had it been a universal or long distance issue there would be no TELEPHONY or Independent telephone companies alive today. Independent telephony simply won out because the real business of the telephone is to connect local subscribers.

The Bell company had reasonable hope of success in a long distance enterprise. It had exchanges in all the large cities.

The Independents did not, and could not, simply because of financial handicaps. An Independent long distance telephone of national scope would be the biggest financial frost ever known.

It is true that there are a few long distance telephone enterprises in Independent service, but they are purely local, simply reaching out into necessary and contiguous territory. St. Louis, Buffalo, Minneapolis, Kansas City, Cleveland, Philadelphia, Grand Rapids, Indianapolis and Columbus are centers of Independent long distance lines.

They are reasonably successful, but their limitations only show that after all Independent telephony is a local issue.

Realizing that a national Independent long distance telephone company is a financial impossibility, no regret can be uttered now because 56.8 per cent. of all the exchanges connect with the Bell. And we must admit that Bell interests know as well as we, that a national long distance telephone company is impossible.

Knowing this, we must see that the Bell company has approached the local ownership idea with a whole heart, and fully realizes the weakness of a one man, one apparatus and one thought universal telephone service.

Those of you who think Independent telephony is dead, get wise to yourself. You would not take the Bell long distance lines as a gift, if you had to operate them. The Bell company barely earns a 6 per cent. on its investment—it must be nearer 5.

If you had these lines, with indifferent connecting agreements, you would soon go broke. If you had these lines without the local toll earnings, you would go broke sooner. The cream of the telephone business lies in the rentals. So don't lull yourself to sleep believing that your toll profits make up for your losses on rentals. It is your salvation to have fair rental rates.

Think of it! After all these years, with an apparent poverty we hold 75 per cent. or more, of all the exchange locations in the United States.

Feel proud of yourself, and further realize that but 9.2 per cent. of the localities have competitive exchanges. Because we do not have parades any more, do not believe we are extinct. Parades are no longer needed.

Do not forget to be proud of the Independent telephone achievements where the 9.2 per cent. exists. This includes St. Louis, Philadelphia, Buffalo, Minneapolis, Louisville, St. Paul, Duluth, Cleveland, Columbus, Indianapolis, Grand Rapids and other places. All these localities have proud Independent systems and successful, too.

You cannot find, in any industrial history, the equal of such a success as the telephone, from the Independent standpoint, has been.

Independent telephony has daily labor days, and the laborer has been worthy of his hire. It has dispensed with the parade, the tinsel and confetti, and now stands as an integral part of the great telephone business.

Let every man resolve, today, to take his five talents, and double them—the opportunity is knocking at your door.

Keep the telephones connected to the 75 per cent. equal to the number conceded to the exchanges of the Bell system.

Let each day be Labor Day from now on.

MORAL: Confession is good for the soul.

Application of Telephone Relays to Commercial Circuits

Description of a Balanced Telephone Relay System, Published in The Electrician, London—Means for Automatically Cutting Out Relay in Case Trouble Which is Liable to Disturb Balance of Line, Develops—Methods Employed for Signaling

By C. Robinson and R. M. Chamney

The problem of increasing the range of telephonic communication by means of relays has occupied the attention of inventors for many years, and several practical forms of telephone repeaters are now on the market. Difficulty has, however, been experienced in utilizing them on commercial circuits owing to

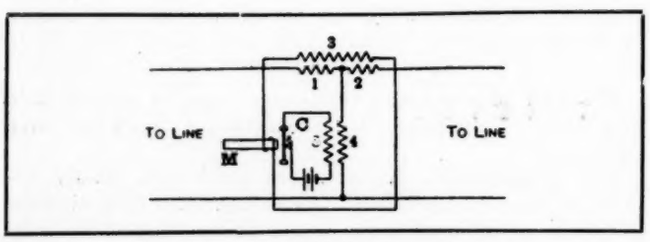

Fig. 1. The Two-Way Relay Circuit.

the necessity of relaying the speech currents in both directions. Trials on working circuits have been made recently by the engineering department of the British post office, and some account of the duplexing methods employed, may be of interest. It is not proposed to deal with the telephone relay itself, which may be of the mechanical type or depend for its action upon the conductivity of gases.

The most reliable methods of providing duplex working on a single circuit, which have been tested hitherto, are similar in principle to that due to Edison. A diagram of this arrangement is shown in Fig. 1 and the action is as follows:

Speech currents from either terminal telephone pass through the winding of the transformer which is connected in the line. These induce currents in the receiving coil of the relay, which in turn acts upon the microphone, producing strengthened currents in the secondary of the induction coils. The strengthened current divides at the center point of the transformer, and, if the impedances of the two lines are equal, it does not affect the receiving coil of the relay.

It was found in practice that this arrangement was unstable, owing to interaction between the microphone and receiver of the relay. The balance of the repeater was upset by the changes of the terminal connections, owing to the fact that the circuit on each side of the relay was not approximately equivalent to an infinite line. This interaction produced a loud, continuous note which effectively stopped all communication.

Efforts were made to increase the stability of the system, and it was found that the arrangement shown in Fig. 2 gave considerably improved results. It will be seen that transformers have been introduced on each side of the repeater station. The windings of these transformers were in the ratio of 2 to 1, the low winding being connected to the relay side. The loss in transmission efficiency, due to the introduction of these transformers, is equivalent to approximately 2½ miles of standard cable, and the gain in stability is considerable.

It was found that it was not necessary to maintain an extremely accurate balance, the more important condition being that the receiving coils should be out of phase with the disturbing impulses from the microphone. That is, the current in the receiver coils due to an increase in the resistance of the microphone, and therefore caused by a strengthening of the flux in the receiver poles, should pass through the coils in a direction to weaken the flux.

If this condition were fulfilled, no "howling" occurred as

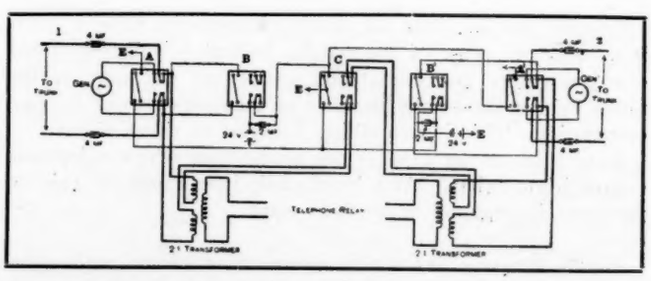

Fig. 2. Relay Circuit Having Improved Stability.

long as the out-of-balance current was less than the received current. It will be seen from Fig. 2 that a switch is provided for reversing the connections of the receiving coils of the relay. By means of this switch the most stable direction for the receiver coils can be found by trial. A resistance with a

sliding contact is also provided for the adjustment of the currents in the two halves of the duplex circuit.

With these modifications, the repeater worked satisfactorily as long as no definite fault occurred on the lines. The improvement obtained for one relay station was equivalent to

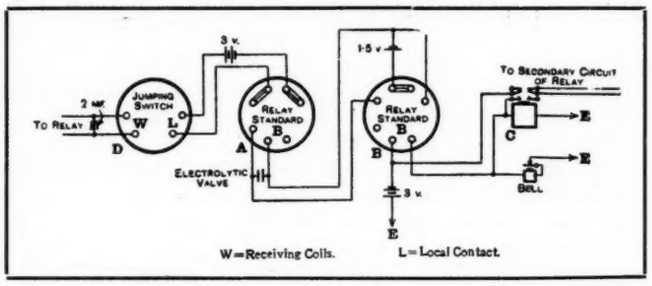

Fig. 3. Device for Cutting Out Relay in Event of Howling.

from 10 to 15 miles of standard cable. If the improvement exceeded 15 miles, or if the line were faulty, the balance became unstable. In either case the relay could be retained in circuit, and some improvement maintained if its sensitivity were reduced by shunting the receiver coils with a resistance, or otherwise.

In place of the transformer, tests were made using a split condenser or inductance coils, or with the receiving coils of the relay wound differentially. These arrangements gave similar results to those obtained with the transformer, the maximum improvement obtainable consistent with stability being equivalent to about 15 miles of standard cable.

In the event of the lines becoming considerably unbalanced the relay commences to "howl." It is necessary, in order that the system may be practicable, to provide some automatic indication of the occurrence of howling and at the same time to disconnect the repeater so that conversation may go on between the terminal stations if the line is not too long.

As the result of measurements of the alternating current in different parts of the relay circuit, due to speech and howling, it was found that the currents due to these causes did not differ sufficiently widely to provide the means of automatically differentiating between them. The only essential difference was that the alternating current due to howling were unbroken, while those due to speech were intermittent. The automatic cut-out shown in Fig. 3 is based upon this fact. The action is as follows:

The strengthened currents from the repeater pass through the receiving winding of a vibrating relay, *D*. The relay used for this purpose was made by S. G. Brown. It consists of a steel reed forming the armature of a powerful permanent magnet provided with pole pieces, upon which receiving coils are wound. A light arm, provided with a carbon contact piece, rests on the reed and normally makes contact with it. When the alternating current passes through the receiver coils, the reed vibrates and causes the contact to be broken.

The receiver coils are shunted with a 2 mf. condenser in order to reduce the loss due to their insertion in the circuit. A polarized telegraph relay, *A*, is normally actuated by the current through the local contact of the vibrating relay. When the latter vibrates, the tongue of the relay *A*, which has a marking bias, moves over to mark. Relay *B*, which is connected on the local circuit of relay *A*, is made extremely sluggish, so that it is not actuated unless relay *A* is held over for about three seconds. This is done by means of an electrolytic valve constructed of two iron plates immersed in a solution of caustic soda.

The valve is normally short circuited by the local contact of relay *A*, and the current divides equally between the windings of relay *B*. When, however, relay *A* is actuated, the valve gradually polarizes and the effective resistance rises. In a certain time, the current in the winding connected in series with the valve, falls to a suffiicently low value to enable the relay to be actuated by the current in the other winding. The time lag depends upon the area of the plates of the valve and upon the bias of the relay. Plates of an area of about 40 sq. cm. were used in the present case.

A non-polarized relay, *C*, is connected in the local circuit of relay *B* in order to provide the necessary local contacts for cutting out the repeater, etc. This relay fulfills three functions:

1. It disconnects the secondary circuit of the telephone repeater from the line.
2. It actuates a bell, or other indicator, to call the attention of the attendant to the fact that the cut-out has been actuated.
3. It locks so that the action is permanent until restored by the attendant. Speech from either end causes relay *A* to vibrate, but does not affect relay *B*. "Howling" actuates relay *A* continuously, and, after the pre-determined time lag, actuates relay *B* and the repeater is cut out.

When the repeater is disconnected, speech can be carried on through the repeating coils if the circuit is not too long for direct speech.

These arrangements render the relay applicable to working lines so far as speaking is concerned, but it was also necessary to provide for signaling between the terminal stations. The arrangement employed for this purpose is shown in Fig. 4.

Generator rings from terminal station 1 actuate relay *B*, which in turn actuates relays *A'* and *C*. Relay *A'* disconnects relay *B'*, and the telephone repeater from line, and applies a generator to the line connected to terminal station 2. Relay *C* disconnects the telephone repeater from both lines.

The action from end 2 is similar, relay *A* being actuated in place of *A'*. Condensers of 2 mf. capacity are connected across the contacts of *B* and *B'* in order that a trembling action of these relays, due to the alternating signaling currents, may actuate the local relays steadily.

The instantaneous impulse received by the telephone relay at the commencement and end of ringing has not been found to affect the telephone relays seriously, but should this occur it will be necessary to signal over a superimposed earth circuit.

All the relays employed in this arrangement are non-polarized and wound to a resistance of 2,000 ohms. Relays *B* and *B'* are provided with heavy armatures so as to be actuated steadily by the generator currents.

In conclusion it should be mentioned that tests carried out

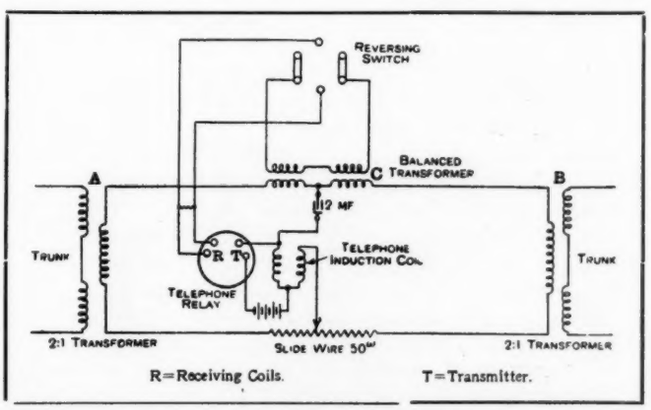

Fig. 4. Signaling System With Relayed Ringing Current.

hitherto have been on open lines which are necessarily subject to disturbance. On underground circuits, owing to their greater stability, a more sensitive arrangement could probably be maintained, giving a greater improvement than that obtainable in the case of open wires.

Citizens Telephone Co. of Grand Rapids Has Good Year

Secretary Wells Reports Earnings of $869,662 and Surplus, After All Charges and Dividends of $10,927 —General Manager Tarte Says Year Has Been Quiet and Uneventful with Substantial Increase of Subscribers—System Has 4,800 Miles Metallic Circuit Toll Lines

The annual report of the Citizens Telephone Co., of Grand Rapids, Mich., to its stockholders, shows that the company has had a prosperous year. The report of Secretary A. E. Wells shows gross earnings of $869,662 and expenses for operating and maintenance of $348,116. After paying taxes of $56,389, bond interest of $24,985, dividends of $231,121 and other charges, the company came out at the end of the year with a surplus of $10,927.

The report of Secretary A. E. Wells is in part as follows:

"The fiscal year just closed marks the first complete year of operation under the uniform system of accounting as prescribed for telephone companies by the Interstate Commerce Commission. While certain changes in the company's system of accounting were made prior to July 1, 1913, yet the complete system was not put into effect until that date. It is therefore impossible to show parallel columns and compare the earnings and expense accounts as carried on the books with the figures as presented in the last annual report. However, as regards net earnings the result under the systems as in effect now and previously are the same.

The system of accounting as prescribed is very comprehensive and in accord with the latest accounting practices, is uniform as regards telephone companies in the various classes throughout the United States and is under the direct jurisdiction of the Interstate Commerce Commission, provision having been made for reports to that body.

The consolidated statement of earnings, disbursements, resources and liabilities for the year is:

EARNINGS.

Grand Rapids revenue		$333,965
Outside exchange revenue		357,483
Toll line revenue		147,115
Other income		7,479
Interest income		23,620
Total		$869,662

DISBURSEMENTS.

Grand Rapids operating and maintenance	$122,404	
Less repairs charged to re-reserve	12,198	$110,206
Outside exchange operating and maintenance	$201,514	
Less repairs charged to reserve	16,068	185,446
Toll line operating and maintenance	$ 62,690	
Less repairs charged to reserve	10,226	52,464
General expense, salaries of general officers and clerks, etc		39,437
Taxes		56,389
Bond interest		24,985
Interest		1,008
Amortization of funded debt expense (Proportion of expense, etc. in connection with bond issue.)		3,301
Depreciation of plant and equipment		154,377
		$627,613
Dividends	$231,122	
Amount carried to surplus	10,927	
		242,049
Total		$869,662

RESOURCES.

	June 30, 1914	June 30, 1913	Increase or Decrease
Grand Rapids exchange investment	$1,515,208	$1,440,696 +	$ 74,512
Outside exchange investment	1,739,522	1,716,244 +	23,279
Toll line system	690,664	691,734 —	1,071
Construction work in progress	28,071	..... +	28,071
Subsidiary companies	309,103	288,858 +	20,245
Stock of other companies	124,351	120,201 +	4,150
Bonds of other companies	50,100	43,500 +	6,600
Bills and accounts receivable	47,633	49,865 —	2,232
Prepayments	33,790	28,249 +	5,541
Unamortized debt, discount and expense	32,711	..... +	32,711
Cash	9,046	24,343 —	15,297
	$4,580,199	$4,403,690 +	$176,509

LIABILITIES.

Capital stock	$3,851,735	$3,851,735	.....
Bonds	$500,000		
Bonds in hands of Michigan Trust Co. as collateral security	72,500		
Bonds outstanding	427,500	175,000 +	252,500
Surplus	55,486	70,524 —	15,037
Reserved for accrued depreciation	136,500	38,619 +	97,881
Bills payable	12,500	169,481 —	156,981
Accounts payable	6,020	18,481 —	12,461
Bond interest accrued	10,688	..... +	10,688
Labor accrued (payable July 3)	13,491	13,536 —	45
Advance rentals and tolls, coupons, etc.	8,503	8,653 —	150
Dividends declared (payable July 20.)	57,776	57,661 +	115
	$4,580,199	$4,403,690 +	$176,509

"It will be noted from the statement that the company has a total of $427,500 of bonds outstanding. The amount of $400,000 of these bonds was mentioned in the last annual report; the additional sum of $27,500 was available for sale after depositing the necessary bonds with the Michigan Trust Co. as collateral security to the guaranteed bonds of the Citizens Telephone Co. of Jackson, and the Citizens Telephone Co., of Battle Creek.

The company still has unissued and available for use as from time to time required for extensions and betterments, $250,000 in bonds.

Previous to last year the item of depreciation, in addition to having been taken care of by the various charges to reconstruction throughout the years, was handled at the end of each particular year by a reduction of the fixed capital accounts from the year's net earnings. That the company has during the past given close attention to the item of depreciation, is evidenced by the low investment per unit. However, under the present system a reserve for depreciation is being established out of expense by definite charges each month.

The annual report furnished you a year ago showed the

surplus account as $70,524. This has been increased during the year just ended by the amount of $10,927, which would show a present total surplus of $81,451, were it not for the fact that certain items in connection with the tax suit, etc., which we were unable to include in last year's statement have since been provided for, leaving the present surplus $55,486. The tax suit adjustment has been taken care of and the company has now no contingent liabilities except those of a very minor nature.

A comparative statement of the earnings and expense accounts of the past year as carried on our books with the same accounts for last year is hardly possible at this time; however, through a re-arrangement and adjustment, viz: placing these items on a like footing with last year, some very agreeable results present themselves. Both the Grand Rapids exchange and most of the outside exchanges show a substantial net increase in profit for the year."

In a review of the year's work General Manager Tarte makes the following statements:

"The year just closed has been a quiet and uneventful one. Business conditions have not been such as would warrant the expectation of much telephone growth in territory that seemed to have already reached the point of saturation, and yet, in spite of these conditions and without any new exchanges having been built, there has been a substantial increase in the number of subscribers served by your company.

The Grand Rapids exchange had a net gain of 534, making the number of telephones in service in Grand Rapids, June 30, 1914, 13,008. The Grand Rapids exchange investment increased $92,903. Outside exchange investment was increased $23,279.

On May 1, 1909, there were 1,660 telephones connected with the Lansing exchange; on July 1, 1914, there were 3,092. An increase of 86 per cent. in five years indicates that the service is popular and that Lansing is growing. The prospects for considerable new business in the near future are very good.

Don't forget that you are able to get connections with every telephone in Detroit and vicinity, over 80,000. Not only can you talk from your Citizens telephone in Grand Rapids, Hastings, Cadillac, or any other point on your own or any other Independent system, to all telephone subscribers in the eastern part of the state, but also all users of telephones in any part of the state can talk with Independent subscribers in the balance of the state.

Your attention was called at the last annual meeting to the fact that the company had completed the installation of a ventilating and dehumidifying system in the main exchange, known as an air conditioning system. The system had not been in operation long enough at that time to ascertain whether or not it would do as was expected of it in the way of reducing troubles in the central office. Now that it has been in operation over a year and we are able to make a comparison with previous years, we find that the results are entirely satisfactory and while undoubtedly some of them would have been attained on account of other improvements in central office condition, the new system must be given considerable credit. Central office troubles during the summer months average but 60 or 70 per cent. of what they did before the air conditioning system was installed.

The new system accomplishes several things. We are able to keep the windows and doors closed so that no dirt of any kind gets into the switchroom and all air that is brought into the room is first washed and reduced to the proper degree of humidity, either more or less than the outside air, and uniform temperature is maintained so that the switches are perfectly clean and are always operating in about the same condition in wet, dry, cold or warm weath r. Employes are working in a room that is pleasantly cool in summer and comfortably warm in winter, and taking into consideration the fact that the combination of dust and dampness causes the switches to work sluggishly and sometimes incorrectly, and dust alone causes poor contacts which result in open circuits, cut-outs, etc., and taking into further consideration the fact that, as the health and comfort of the men improve, their efficiency is likewise increased, it necessarily follows that the new system must be given some of the credit of the reduction of troubles.

The installation of the main exchange was completed in January, 1904, and it has now been in operation over ten years. About 18 months ago a general inspection of main exchange apparatus was started for the purpose of rewiring all switches and replacing all worn out parts. Every automatic switch that is taken out for repairs is rebuilt and rewired and when put back into place is as good and as serviceable as it was when it was first installed. About 60 per cent. of the line switches and 80 per cent. of the trunk switches have already been taken care of, and the work will be continued until all the apparatus has been gone over.

Undoubtedly the reduction in central office trouble is due to this work as well as to the improved conditions resulting from the installation of the air conditioning plant.

Every telephone that is brought into the central office is sent to the inspection department shop and practically made into a new instrument before being placed back into service. These telephonese are rewired, re-nickeled and re-varnished. Worn out springs, governors, dials, etc., are replaced and tested before they are again placed in service.

The trouble department of the Grand Rapids exchange has been moved into larger quarters with improved facilities for testing and locating trouble, and a new follow-up card system installed that will undoubtedly result in the elimination of a great number of duplicate troubles. Practically all of the outside construction and reconstruction work done during the past three or four years has been along the line of "all cable construction," and the result is that the Grand Rapids exchange is gradually being exchanged into a complete "all cable construction" plant. This means a large reduction in the future in the number of line troubles per instrument.

There are still some exchanges that are not earning enough to pay all expenses of operation, maintenance and depreciation and leave a reasonable profit on the investment. Several exchanges of this type were placed on a paying basis last year and continued efforts will be made to take care of others in the future.

Attention is again called to the fact that your company is the owner of a system that embraces a large portion of Western Michigan, included in which are 80 exchanges from Traverse City on the North, Lansing on the East, Athens on the South and Holland on the West. It owns 4,800 miles of metallic circuit toll lines, mostly copper, and also connects with the lines and exchanges of other Independent companies, by means of which long distance service is given to practically every point in the state."

Peace Reigns at Clinton, Ill.

The trouble between the citizens of Clinton, Ill., and the Central Union Telephone Co., which resulted in a raid being made by a mob of citizens headed by the state's attorney, on poles erected by the company, has been settled. At a meeting attended by C. H. Rottger, general manager for the receivers of the company, it was agreed that the company should remove its poles from West Woodlawn avenue and other streets where property owners objected to their presence, and place them elsewhere. The city authorities admitted that the company had a right under its franchise to erect poles in the streets.

The Rejuvenation of the Craneville Telephone Exchange

A Serial Story Telling How a Rundown Telephone Plant Was Rebuilt, Enlarged and Changed Successively from a Grounded to a Local Battery Metallic System and Later to Common Battery —Problems Encountered by Every Practical Telephone Man

By Paul Hamilton

"Well, Frank, in what shape did the storm leave us today?" Mr. Barrows inquired as Frank came into the office one evening.

"We had to clean all the carbons. A great many heat coils were blown. That, of course, was at this end. There didn't seem to be so many carbons grounded at the protectors."

"Well, that was no misfortune at any rate. Sorry they haven't shipped the equipment I ordered for your test table in the cable house. That would make it easier to find out what carbons were grounded."

"I guess I wouldn't know how to use it, anyway. Today I took a buzzer and connected one side to battery and tested what should be the open side of the carbon block."

"How did it work out?"

"Pretty good if they were grounded badly, but not much good for smokey ones. The Doctor came in and improved on it a little. He took an instrument bell and connected one side to generator and used the other for testing. He said the alternating current would finish the job on a high resistance ground in the carbons."

"He was right at that," said Mr. Barrows, "but the operators and subscribers were complaining all morning about the bells tingling, in many cases ringing quite clearly. I was going to ask if you knew what the trouble was, but the generator test explains it."

Germany and the Doctor were present during the last part of the conversation, and the Doctor said: "I did not think of that."

"Make him a picture, maybe I see him then," said Germany. "I always think the line was open with the hook down?"

"All right. It is this way (Fig. 141). You see, when the hook is down the bells are still across the line through the condenser. Now, by putting generator at *X* on either carbon, the current has several paths to follow, even if there is no ground connection between the carbon blocks. Your test bell, too, would ring many times when the carbons were clear, in case the resistance did not prevent it. Often it would arc across the smoked carbons and, reducing the resistance, ring more clearly."

"That was about all I could make out from it," the Doctor said. "I examined a lot of carbons that were clear before I was able to tell the difference."

"Frank's battery test was the better plan because it did not cause any additional trouble or annoy the subscribers and operators. Neither plan is acceptable for general use. The list of permanent signals at the board would give you the information as to one side of the line. Noise on the lines would eventually show if the line side were grounded. The operators would also ring in more grounds in the way the Doctor rang them in."

"On the whole, your idea has its merits. It was justified on the ground of clearing the trouble before the subscriber would discover and report it. In testing for and clearing trouble, always give the subscribers first consideration; that is, annoy them as little as possible. When you have reason to believe a subscriber knows his line is in trouble, it is good practice to call him and let him know when the trouble is cleared.

"Sometimes a line may be in trouble for hours and the subscriber not be aware of it. In such cases, it may be just as well not to call attention to the fact. There is a difference of opinion on this question, which is often governed by local conditions and the general attitude of the public, so it is not advisable to adopt a hard and fast rule. I like to keep

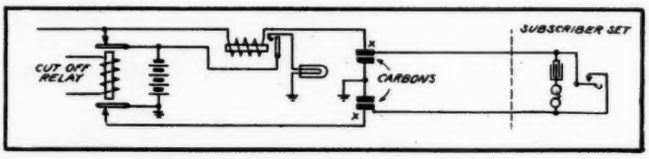

Fig. 141. Relation of Bell of Subscriber to Office Carbons.

in touch with my subscribers—have them in my confidence so to speak. Hence, sometimes, I find advisable to give them information about the telephones being in trouble when they were not aware of it.

"There are some cases that are very annoying. Suppose, for instance, while some of our lines were out this morning, that Jones tried to get Brown and failed. Jones might forget it until he sees Brown maybe a week later. Then he tells Brown about it. Now, if Brown knows his telephone was out of order, having been so advised by you when you cleared his line, he will tell Jones so and probably nothing further will come of it. But, if he knows nothing about it, he is liable to make a general complaint, without date or data. Such a case stimulates his imagination.

"Well, I guess we will leave it at that and take up the instrument circuit. The common battery instrument is really more complicated than the local battery set. In general, it does not get into trouble as frequently, and is, I think, more cared for. As you know, it is entirely different from the local battery set.

"Beginning with the transmitter, we find about all the change made, was to substitute one of higher resistance. This was done because we increased our voltage more than four times. In general exchange practice, the high voltage is not required for transmission but for signaling. We haven't increased the resistance of the line. Therefore, to reduce the amount of current in the talking circuit, the resistance of the various parts is increased. The resistance of standard transmitters of various types is approximately 100 ohms.

"From the transmitter we go naturally to the induction coil. In a local battery set, we use approximately four volts. In passing this current through the primary of the coil, it was necessary to transform it to a higher voltage in the secondary winding to secure sufficient force to drive it to the other instrument.

"In common battery, we already have a higher voltage. So instead of using a 'step-up' coil, we substitute one that is very slightly opposite, or a 'step-down' coil. Coils, however, vary considerably, being designed for the particular instrument circuit in which they are to be used. It is advisable, as a general rule, not to replace any part of the instrument equipment with that of another manufacture.

"The receiver; he isn't the same either?" Germany questioned.

"No, that is different also. You remember the trouble you had about the old receivers becoming demagnetized? That

was due to their peculiar construction. We used the single pole receiver until we changed the instruments.

"Here (Fig. 142-*A*) is the way the single pole receiver was constructed. Current passing through the winding the wrong way, neutralize the effect of the magnet upon the soft iron core; not all at once, but gradually, or you could have discovered it when you connected a receiver wrong.

"In the double pole receiver, which we now use, the arrangement is like this (Fig. 142-*B*). By using a horseshoe magnet, both poles are brought to the diaphragm. The spools are wound in opposite directions and connected in series. Thus the action of the current is never in a single direction."

"But they are not round," objected Frank, "like other coils?"

"No, they are made oblong or oval shaped for this reason: The attraction of the diaphragm should be as near the center as possible. Here is the idea of winding the coils oval. In this one (Fig. 142-*C*) you see the poles are a distance each side of the center. With the oblong form (Fig. 142-*D*), they are brought very much closer, thus increasing their power to attract the diaphragm.

"Now we will set up a circuit. Beginning with the line coming in, we go to the primary winding, (Fig. 143-*A*) and from there to one of the open contacts of the hook. This being the battery side of the line, there is no chance for battery to flow further with the receiver down. By raising the hook, we close the circuit back to the other side of the line through the hook and transmitter. We also close another circuit; that is, the receiver, from the other open contact through the receiver, secondary winding, and condenser.

"The condenser is the added feature of this system over our local battery circuits. Its use is not thoroughly understood generally. Some will tell you that it is there to avoid connecting the bells across the line or to ground. The bells, however, can be connected to a lower contact of the hook and be closed when the line is not in use like this (Fig. 143-*B*). The resistance of the bells will be high enough to prevent a permanent signal."

"But you would ring through the transmitter," objected the Doctor.

"It is not generally claimed to injure the transmitter; it rather insures it from packing. Although it is not considered good practice to ring through either the receiver or transmitter where it can be avoided, the damage resulting to the transmitter would not justify the expense of using condensers."

"I asked one of the men who changed the instruments why the condenser was used. He told me that it was used to keep out the noise," said Frank. "I asked him if that were the case, how we heard at all. He said there were

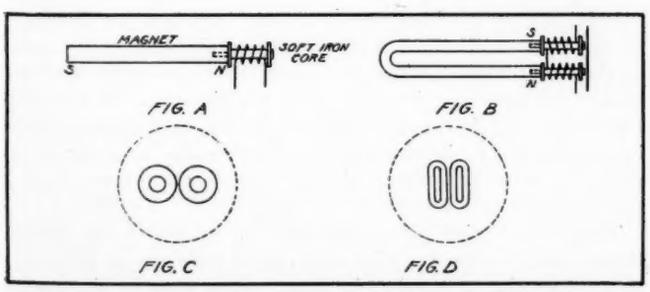

Fig. 142. Single and Double Pole Receivers.

different kinds of noises and some of them would go through a condenser and some wouldn't and that was what the condenser was for—a kind of a sieve."

Mr. Barrows was amused at this statement. It diverted his attention from the point under discussion. Closing his note book, he lighted a cigar, and became reminiscent.

"The telephone profession," he began, "is of a more recent origin than the telephone itself. It is surprising to look back and see how much has been accomplished by men who knew very little of the fundamental principles. The practice of giving a fairly intelligent man a set of tools and letting him blunder into the ways of doing things was followed

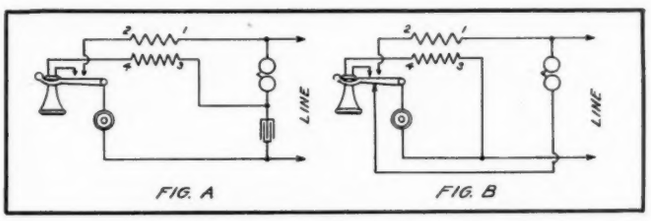

Fig. 143. Instrument Circuits With and Without Condenser.

so long that not until quite recently, could even the larger companies be convinced that theoretical knowledge added to a man's constructive or mechanical ability and his usefulness to the company.

"Men of the old school pointed to employes of years' experience who were really competent in the full sense of the term; men, who, although working daily with screwdrivers and pliers, had actually made widely known and useful improvements in devices for enlarging the use and advantage of the telephone. Many gifted young men who later followed the profession, learned to look upon these men from the ranks as examples. I presume the man you talked to was one of these. But telephone practice today has reached a point where an ambitious man must know the theory. The deeper he goes into the vital points, the more thoroughly he becomes schooled in the 'whys and wherefores' and naturally is more competent to perform this work, no matter how simple the execution may seem. Not knowing why the condenser is in the circuit, made that man careless concerning it.

"You may not agree with a clock tinker when he says there are no extra wheels in a clock. You may think you know better—if you have ever taken a clock to pieces. It is the same with a telephone set. There is nothing superfluous in it.

"We will get to the real use of the condenser at the next conference. Tomorrow morning you had better begin a systematic inspection of instruments following out the routine I have outlined on these sheets. After you have been out a day or so, we will discuss the items separately. I guess that will be all for tonight."

(*To be continued.*)

Telephone Growth in British Columbia.

The British Columbia Telephone Co., of Vancouver, B. C., has added 1,306 new telephones to its system throughout the province since January 1, 1914, according to a statement by the company. There has been a steady growth of telephone business in the outskirts of the city of Vancouver. The net increase for the province of British Columbia was 3.1 per cent.

Advertising Combat at Washington, Ind.

To combat the Pike County Telephone Co., Washington, Ind., in its campaign to get subscribers for the new automatic exchange, the Central Union Telephone Co. is using advertising space. A recent ad, taking a full page, was a map of the county showing the location of all the company's telephones outside of the city of Washington, and making comment on the service rendered.

New Telephone Building at Goshen, Ind.

The Home Telephone Co., of Goshen, Ind., will be in a new building on September 15.

Public Relations of Utilities in Theory and Practice

"The Public Be Benefited!—Persuade the Public It Is Being Benefited!"—Opportunity Now at Hand for Cultivating Good Will Spirit Among Utility Patrons and the Public—Methods for Promoting Good Will—Questions to be Discussed

By Public Relations Engineer

It has before been stated that we are convinced it will not be easy to get utility patrons, or the public, to agree that an individual's desire for personal advantage of any sort—at the expense of the common good—is as unquestionably an evidence of the "public be damned" spirit, as is the desire to charge all the traffic will bear. And it certainly will *not be easy* to persuade men to *act patriotically* regarding this matter. It will not be easy to get certain utility managers, fiscal agents, or promoters, to see or to act patriotically with reference to the fact that the public has the same right, justification, power and duty to take a utility plant—if required for the common good—as it had to arrest the farmer of my boyhood days who, by the use of his shotgun, tried to prevent the construction of a railroad across his farm.

But during this period of the world's greatest war, during business embarrassment and political upheaval; and during the time of greatest sorrow and perplexity of philanthropists, educationalists and religionists, it should be and doubtless will be *easier than at other times,* to convince both the public and the utility men of this important need. While the greatest war in the history of the world is being fought, and for some time after it has ended, it ought to be easier than at other times, to persuade the citizens of the one great friendly nation, that they must be more self-sacrificing than they have been. They must be more true and more patriotic in their friendship for each other and in their service of the common good. It ought to be easier to convince the citizens of this nation of this fact; while this country is the active friend of all nations, upon us more than any other similar body of men, and upon us at this time more than at any other time, rests the responsibility for "thinking a way through" the perplexities that puzzle us. Upon us rests the duty and the obligation of bringing genuine, helpful good will into the endeavor of the state and of business and industry, and also the duty of bringing genuine and complete serviceableness for the whole human race into our philanthropies, our education and our religion.

"Just Suppose."

More or less editorial comment has been made concerning the query of an Eastern paper as to what would be the outcome if we might:

"Just suppose" that when Congress proposes to reduce the 3 cent passenger fares or the freight rates, the railroads were permitted to suggest a reduction of the mileage rate which is allowed congressmen for their trips back and forth across the country; "just suppose" that when Congress "or the public" demand greater efficiency and more stringent economy at the hands of the utilities, the utilities were permitted to investigate, criticize and demand greater efficiency and more stringent economy in the handling of the congressional pork barrel, and in the administration of the finances of the states and municipalities.

These and other "just supposes" have furnished food for considerable thought among the people of many localities.

There seems to be more or less of an awakening to the fact that the public cannot hate nor antagonize its servants, the utilities, enough to make them love the public; and that both sides must seek to "get right," rather than merely to "get even." Certain utilities are now offering prizes to employes and to the public for helpful criticisms and suggestions *for the improvement of the utility's relationship to the public.* Some utilities are proving beyond doubt, we think, that they desire to "get right" rather than to "get even" with the public.

Would it not be equally beneficial if the public were to offer prizes for suggestions for the improvement of public sentiment and for helpful criticisms of the public's relationship to the utility? Since it might be unwise to expect, and unsafe to wait for, the public to offer prizes for ways and means by which to better its relationship to the utilities, might not a great benefit be bestowed upon the public if the utilities would use one-fifth or one-half their publicity expenditures for the payment of prizes for the best essays or "papers" dealing with these matters? Most people are acquainted with the plan and practice known as the "Demarest Prizes," which promote oratorical contests in the interests of temperance. Why not offer prizes for the best essays, as pronounced by teachers of political economy, concerning some such general topics as are set forth in the following?

One Topic for Essays.

What, if anything, may we hope to see established, within the next 15 years, that will point out more effectually and more satisfactorily the things for which mankind has an increasing need or desire, than is now being shown by the rising prices of the world's market? What may we hope to see established within the next 15 years that will point out more effectually the things for which mankind has a decreasing need or desire than is now being indicated by the falling prices of the world's market? For instance, my father bought one of the first self-binding harvesters sold in Iowa at a cost of $345. He had nothing to give in exchange for it but corn at 10 cents a bushel. Therefore his harvester cost him 3,450 bushels of corn. On a recent date 3,450 bushels of corn would have exchanged for 20 harvesting machines of a very much better quality. In the meantime one of my brothers had changed from producing corn to producing harvesters and he complains of the constantly rising price of corn.

When I was a barefooted boy on my father's farm, I carried three pounds of 8-cent butter and four dozen of 6-cent eggs to town in exchange for two gallons of 24-cent kerosene. Another of my brothers left the farm to run a grocery store in which he is now exchanging 20 gallons of kerosene for three pounds of butter and four dozens of eggs. He also is complaining of the high cost of living. But will not the price of eggs and butter become still more prohibitive if the sons of the other men continue to change from producers to consumers of eggs and butter? Will not the price of corn, as contrasted with harvesters, continue in the same general trend in the future as in the past if other men's sons insist on changing from the corn-producing class to the harvester-producing class?

There was a time when one man out of ten in the United States was in town and nine men out of ten were in the country. Now the proportion is about seven men in the towns and villages to only three on the farms. In the former days farm wages and farm profits were, on the whole, lower than town wages and lower than town profits. But since only about one-third of the population is on the farm, it is the town wages and the town profits that are on the downward side of the scale. Now if two more out of the ten should see fit to move from the farm to town, as all of my father's children

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have done, how high a price do you suppose that one remaining farmer could command for his butter, eggs, meat, bread, wool, etc., from the nine "city chaps"?

Can any theoretical ideal, or any set of words on the law books, cheapen living for people who run away from the atmosphere of the dairy and the corn fields because of their preference for the atmosphere of the moving picture shows and the pavements? If, instead of only five millions preferring to live in "Greater New York," 99 of our 100 millions should move there, might they say to the remaining one million: "If you let us starve you are not Christians. We will work, if you figure out how. By working in New York City, we can get a living wage in that particular craft to which we belong. But we will not go to any other place, nor will be work at any other trade." Would the one million outside of the city be bound, as Christians, to provide "charity food" for the 99 millions?

What, if anything, can cheapen the cost of living for, or increase good will among those who are either unable to understand or unwilling to be guided by the rising and falling of prices?

Must not some one do a certain amount of guessing, predicting, or prophesying, as to what will be demanded, next week, next year, or ten years hence, by the prices which at that time shall be rising? And must not some one guess what will be rejected next week, next year, or ten years hence, by the prices which at that time shall be falling? If I am either unable or unwilling to do at least my full share of this guessing concerning what prices will rise and what prices will fall, must not some one else guess, predict, or phrophesy in regard thereto, for himself and me also? In other words, if I am either unwilling or unable to face the facts, or to master the factors, of this world market, do I not prove or confess that I am unwilling or unable to find out or to do, of my own accord, that thing which mankind needs most that I should do? Do I not admit that I, as an individual, am either unwilling or unable to be as serviceable to the public, or to mankind, as public sentiment or the law demands that utilities and other organized undertakings shall be?

Is it not my duty, as an individual, to endeavor as far as possible—by studying the rising and falling prices as well as by all other known means—to find out the things that mankind is most likely to need during the next ten years; and then to find out which of those most needed things I can best fit myself to supply or provide?

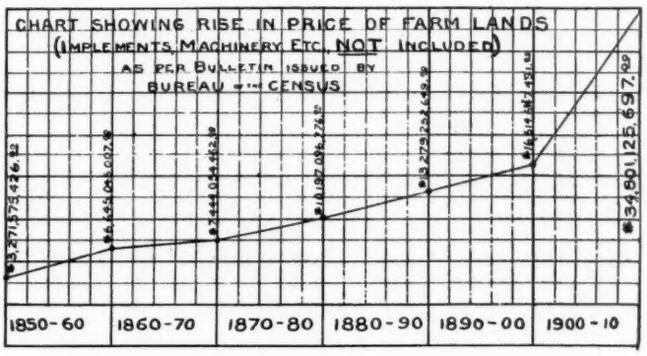
Another topic for an essay might take up the following question: To what extent and how, if at all, is it possible to escape from the hazard and the inevitable cost of experimentation in connection with the best guesses that can be made concerning the future needs, demands, or desires of mankind as indicated by the rising or falling prices of the world's market? For instance, was the development of the cable car a menace to the horse-drawn street car? Was the invention of the trolley an expense for the cable car owners to meet? Is the possibility of some further improvement a risk that is ahead of those who today must buy trolley cars for publicly owned or privately owned utilities?

1850 (Census figures)	$ 3,271,575,426
1860	6,645,045,007
1870	7,444,054,462
1880	10,197,096,776
1890	13,279,252,649
1900	16,614,647,491
1910	34,801,125,697
Increase since 1860	906 per cent.
Increase since 1900	109 per cent.

Through all the varying experiences of business the trend of the price of farm land has been upward, with the steepest incline coincident with the exhaustion of the free lands suitable for farming.

Farm Land Prices, Entire United States, 1850-1910.

Is the possibility of a wireless telephone system a menace to those who, in the realm of communication, are building wire lines for the service of the public?



The Upward Tendency of Farm Land Prices.

Could these risks or these expenses, due to invention and progress, be done away with or be escaped from, under public ownership any more than under private ownership? And, do not the taking of these risks deserve a premium just as surely as a premium is necessary for those who carry the risk of crops being destroyed by hail or buildings being burned by fire?

It might prove beneficial to quote from the U. S. Census report, the figures which show that the value of farm lands, after taking out the value of all improvements, has advanced more than 900 per cent since the first record was made in 1860. And that with this rise in the market price, there has been no increase in the quantity, with a decrease rather than an increase in the productivity or quality. It might be well to quote, from the government records and those of the most reliable commercial agencies, the figures which show that the rise in the price of food products (from the rising land prices) has been more than twice as much as the average advance of prices generally. It might be a good thing to show that the mere advance in the value of farm lands, (minus improvements), has been more during the last ten-year census period than the sum total of the market price of all the railroads of the country, and about the same as the present market price of all the other utilities combined.

It would surely help to a better condition of good will to show that the advance of the market price of city lots, timber, and mineral lands, water power lands, etc., has been as persistent and as enormous as has been the rise in the price of farm acres. It would also help if attention were directed to the fact that, whereas there has been an increase of both the quantity and the quality of utility properties there are no more farm, timber, and mineral lands and water power sites now than existed before the prices ran so high. Cognizance should be taken of the fact that the quality of these lands is not better but worse, if anything, than when their prices were lower. Prizes might be offered for the best essays in answer to the following:

In the world-market, what articles or marketable things have increased most in price during the last 10 or 15 years? What articles or marketable things have decreased most in price during the same period? Has any general group of marketable things increased in price more, or more irresistibly, than food products or the products of the farm?

According to the United States Census or some other reliable source of information, what has been the yearly ratio of increase or decrease in the average market price per acre

of all of the land in the United States during the last 50 years? What has been the total increase or decrease of the average market price per acre of all of the land in the United States during the last 50 years? What, if anything, has been added to, or deducted from, the productivity or quality of these acres during this half century? What, if anything, has been added to or deducted from the area or quantity of these acres during the last half century? What has been the total increase in the market value of the town lots minus buildings, power sites minus improvements, virgin timber land, the mineral lands (including coal and oil) and the farm lands minus improvements, during the last half century?

What is the safest prediction that can be made concerning the rising or falling of the prices of food and the rising or falling of the prices of land, during the next 15 years?

What has been the total increase and the yearly ratio of increase in the market price, or value, of all of the public utilities of the United States during the last 50 years?

Looking upon the railroad mile and the telegraph and telephone wire-mile, etc., as a unit, what has been the total increase or decrease in the price per unit; and the yearly ratio of the increase or decrease in the price per unit of the public utility properties during the last 50 years?

To what extent if at all, is there an unequal requirement, so far as public sentiment is concerned, as to the increasing and perpetual serviceableness which is demanded of organized undertakings on the one hand and the absence of any similar demand, so far as individuals or the private owners of land are concerned, on the other? To what extent if at all, is there an unequal requirement, so far as the demand of the existing law is concerned?

For what reason, or reasons, if any, should the individual who seeks free utility service or a less-than-cost rate, or who as the owner of land charges all his traffic will bear, be looked upon by public sentiment as less guilty of the "public be damned" spirit, than the individual who would charge all a utility traffic will bear? For what reason or reasons, if any, should the individual who dodges taxes, tolerates, commends or profits by the congressional state or municipal "pork barrel"; or who dodges civic duty of any sort, be looked upon by public sentiment or treated by law as less guilty of the "public be damned" spirit, than one who disregards the common good in any other manner?

Why should the man who holds out of use, or refuses to cultivate, the land that is well adapted for use in production of milk, butter, eggs, poultry, meat or bread, be treated more leniently by public sentiment or by law, than the man who would refuse to operate, or fail to operate, the railroad that is adapted for use in hauling such necessities to those who need them?

To what extent, if at all, is the efficiency or serviceability of the utilities to the public interfered with by factors, forces, or influences which the utilities, in and of themselves alone, are powerless to overcome? For instance, is the usefulness of utilities to the public interfered with in any manner by reason of defects on the part of philanthropists, of wage-seekers unions, or of our schools or churches? If such is the case, what are some of these defects? In what manner may these interferences, or defects, be overcome?

Would it not help along the cultivation of "Good Will First" if the utilities were to cite the figures, recently published by a European financial journal. These were to the effect that about one-third of all the long term securities placed upon the world's market last year (1913) were government bonds —federal, state, municipal, etc. It was stated that the annual offering of government bonds for the 20-year period ending in 1913, was two and a half billions—which was double the average of the preceding period.

If the public were to undertake the immediate purchase and operation of all of the existing privately owned public utilities what kind of bonds or other securities would have to be marketed by the federal, state and municipal governments, in order to pay a just and reasonable price to the private owners for the utility properties and businesses? What is the total value of the actual additions to and the actual improvements of all the utilities of the United States, as made by private owners, during the past 15 years? What is the average annual value of these additions and improvements?

What is the safest estimate as to the average annual value of the extensions and the improvements that will be required by reason of advance in the arts, progress in civilization, and increase of population, up to the year 1930? What is the safest estimate as to the total value of the additions and improvements to the utilities of the United States, that will be required up to the year 1930?

For what period of years would it be most practicable for the federal, state, and municipal governments to issue their bonds. If 15 years or more is the period for which government or public utility bonds of this sort should be issued, what would be the total amount of the outstanding bonds or indebtedness of the governments on or about the year 1930, for original purchase price and improvements and additions for 15 years?

What has been the total rise or fall in the market price of the government bonds of England, France, Germany, Russia and the United States during the last five years? What is the safest estimate that can be made as to the probable increase or decrease of the market value at which it will be possible to sell bonds of this sort, including bonds of the United States, during the next five years? To what extent will the estimated price, if above par, tend to reduce the ratio of annual interest or tend to increase the interest if the estimated sale price is below par?

To what extent will the world's greatest war, which is now in progress, and the inevitable accompaniments of such a war, tend to increase or decrease the total indebtedness of the governments of the world? To what degree will this increase or decrease of the indebtedness of the governments of the world, in consequence of this war, tend to help or hinder the marketing of the federal, state or municipal bonds of our country?

To what extent will a correct prediction concerning the rising or falling of the prices of these things during the next 15 years, be helpful to every individual who desires to do during that period those things which mankind needs most that he should do? To what degree will an erroneous prediction, or indifference, hinder the individual who desires, proportionally to be as serviceable, during the next 15 years as public sentiment and the law demand that public utilities shall be?

What, if anything, needs to be done to help the average man who criticises "things as they are," to realize more completely that before judging, criticising, antagonizing or stirring up ill will he should acquaint himself with all of the facts and factors affecting the thing about which he complains? What can be done to accomplish this end? What needs to be done to promote good will and to quarantine ill will? What can be done to promote the common good?

Will not the giving of prizes for the best essays along these and similar lines, and for reliable accounts of the best actual accomplishments in the way of improvement, help to turn attention in the right direction? Might not a portion of the time and talent of every welfare organization—religious as well as secular, social as well as industrial and educational as well as civic—be profitably expended along these lines?

Would not an effort of this sort naturally grow into local, state, national and international "Boards of Public Sentiment" similar to existing boards of health? From these efforts would there not be evolved a "Science of Public Relations" just as the boards of health have evolved the science of sanitation?

Proceedings Before Commissions, Courts and Councils

Discussions and Rulings of State Bodies Having Supervision of Telephone Companies, Decisions of Courts in Matters Affecting Public Relations of Utilities and Actions of City Councils Bearing Upon Franchises, Rates and Service

Approaching Rate Hearings in Maryland.

A busy half year of investigation is scheduled for the Public Service Commission of Maryland. The first investigation on the calendar, which will be taken up on October 1, is that covering the valuation, rates and service of the Chesapeake & Potomac Telephone Co. The complainant in this case is the Telephone Protective Association, represented by Osborne I. Yellott, who has been engaged for several months in gathering data and preparing for the inquiry.

The application of the Telephone Protective Association was the outcome of dissatisfaction with the schedule of rates established by the commission on January 2, 1912, as a result of the application of the Chesapeake & Potomac Telephone Co., first filed on August 18, 1910. Abolition of flat rates under the commission's order was extended for six months from October 1, 1912, to enable the present complainants to present their case, based on an appraisal of the property. The telephone company agreed to furnish the commission a complete appraisal of all its physical property, not only in Baltimore but throughout the state, and to co-operate with the commission's engineers and the investigators of Mr. Yellott in arriving at a valuation of the property.

In making the valuation the unit system was adopted. The tables prepared for the consideration of the commission show three totals—the valuation of the company, of the chief engineer of the commission, and of Mr. Yellott.

In presenting the case to the commission Mr. Yellott and his assistants will submit tables comparing the telephone rates in Baltimore with those in effect in other cities to show that the Baltimore rates are excessive. They will also try to show that the 6 per cent. allowed for depreciation is largely in excess of that allowed in other states.

W. W. Anderson, 307 Marquette Building, Chicago, has been engaged by the Public Service Commission of Maryland as engineering expert to assist in the state-wide investigation of telephone rates.

Contempt Order Sought in Portland Hotel Case.

John B. Coffey, receiver for the Northwestern Long Distance Co. has filed a petition in United States District Court at Portland, Ore., asking that the Pacific Telephone & Telegraph Co. be adjudged in contempt of court.

The petition charges that the Pacific company has violated the terms of the decree of March, 1914, in which the court ordered interchangeable use of the Home and Pacific telephones in the Hotel Benson. Mr. Coffey charges that the Pacific company induced the Benson management to remove the Home telephones from the rooms, connections then being made in such a way as to cut off the Northwestern Long Distance company from all long distance business originating in the rooms.

Bloodhound Owner Has Telephone Hearing.

Bob Owens, of Bedford, Ind., famous as an owner of bloodhounds, recently appeared before the Indiana Public Service Commission with the mayor and city attorney of Bedford in support of his petition for a revision of rates, elimination of alleged discrimination and an improvement of the toll service of the Central Union Telephone Co. The petition was drawn, Owens said, because chiefs of police of cities and towns that had desired to get into communication with him regarding the use of his bloodhounds to track criminals had been unable to do so when the Central Union operators at Bedford refused to "put through" the toll connections. Since the Owens petition city officials at Bedford have taken up the case for a revision of rates there. Much of the testimony before the commission was given by company experts on the question of valuation of the company's property at Bedford.

Spokane May Vote on Franchise.

On account of the talk of a referendum petition being filed against the new franchise of the Pacific Telephone & Telegraph Co. at Spokane, Wash., as a result of the activities of the Spokane Public Ownership League, a special city election will in all probability be held during the latter part of November. Three of the city commissioners are said to have practically agreed to vote for the special election if it is proposed.

A Telephone Complaint From Ashville, N. C.

There is some agitation at Ashville, N. C., arising from the fact that telephone subscribers who glance hurriedly at their directories frequently call the street number of the party desired instead of his telephone number, and thus disturb the siesta of the wrong party. It has been suggested that street numbers be omitted from the directories.

California Commission Trains Guns on Manager's Salary.

The Railroad Commission of California, in a recent decision upholding the application of T. H. Dassel, owner of the Morgan Hill Telephone Co., of Morgan Hill, Cal., for an increase in rates makes the following comment relative to the item of manager's salary in the operating expenses:

> Regarding operating expenses, reference has already been made to the item of $1,200, manager's salary. While it is very plain that if the applicant personally performs this service he is rightfully entitled to such saalry as the service is worth, it will be noted that the amount which was charged to this item in 1913 represents 48 per cent. of the total investment or 70 per cent. of the gross receipts for that year. The applicant testified that, as nearly as can be estimated, no account having been heretofore kept of the time actually devoted to the work, it would cost approximately $30 per month if it were necessary to employ outside linemen. For the time which it is actually necessary to devote exclusively to the management of this business and allowing sufficient in addition to cover what it would cost to employ outside linemen, I am of the opinion that a salary of $70 per month is sufficiently liberal and is not an unreasonable burden to place upon operating expenses.

Crossing Construction Order of Pennsylvania Commission.

The Public Service Commission of Pennsylvania has issued its general order No. 11 superseding its general order No. 2, in the matter of the regulation of the crossing of facilities of one public service company with those of another public service company, other than crossings between railroads and street railways. A company desiring to cross the facilities of another company shall give 10 days' notice to the company to be crossed specifying the character of such contemplated crossing, or in case an agreement exists between the two companies, shall notify the commission as to the crossing to be made. Protests against such crossing may then be filed with the commission by the com-

pany affected and a hearing be held of the commission may of its own motion direct that such crossing be not proceeded with.

Separation of Lighting and Telephone Wires at Lexington.

Officials of the Lexington Utilities Co. and the Fayette Home Telephone Co., of Lexington, Ky., have agreed on plans for the separation of the lighting and telephone wires on the city's streets, subject to the approval of the board of commissioners. The plan provides that all of the telephone wires shall be assembled on the side of each street on which they are now in the majority, while the same arrangement holds for the lighting conductors. The agreement as drawn up covers all of the streets, subject to the approval of the commission.

$20,000,000 Telephone Mortgage in Ohio.

The mortgage of the Ohio State Telephone Co. to the Bankers' Trust Co., for $20,000,000, which was recently filed in the various counties of Ohio, where the 15 constituent companies in the merger are located, is causing comment as the largest mortgage that has been filed for many years. The mortgage is for the purpose of floating the bonds of the consolidated company.

Receiver for New Jersey Company.

The Court of Chancery at Trenton, N. J., has declared the insolvency of the Paterson, Passaic & Suburban Telephone Co., and ex-Assemblymen George F. Wright, of Paterson, has been appointed receiver under a bond of $25,000. The company operates in Paterson and vicinity. James Kerney, receiver of the Interstate Telephone & Telegraph Co., instituted the suit against the North Jersey concern.

Summary of State Commission Hearings and Rulings.

CALIFORNIA.

Decision No. 1699: Order finding that the present rates of the Morgan Hill Telephone Co. are not sufficiently remunerative and establishing a tentative schedule as follows: Business wall telephones, $2.50; residence wall telephones, $2; two-party business, $2; two-party residence, $1.75; four-party residence, $1.50. Opinion states that the item of $1,200 retained by F. H. Dassel, owner of the company, for his services as manager, is 48 per cent. of the total investment or 70 per cent. of the gross receipts for the year, and should be reduced to $70 a month.

INDIANA.

August 31: Corunna Home Telephone Co., of Corunna, Ind., granted permission to increase its telephone rate from $1 to $1.10 where dues are not paid by the tenth of the month.

August 31: Mooreland Rural Telephone Co. refused permission to raise rural switching rates $3 a year.

August 31: Alford Telephone Co., of Fortville, Ind., granted certificate of public convenience and necessity.

MICHIGAN.

September 5: Permission granted to the Citizens Telephone Co., of Grand Rapids, to issue bonds to the value of $100,000, the money to be used in improvements and extensions. Last year the company expended $92,000 for improvements and extensions, paying a large portion of the amount from the current earnings of the year. The new bonds are to provide the funds in excess of the amount taken from the earnings and to finance improvements and extensions for the coming year.

MISSOURI.

August 27: Case No. 474; order granting request of C. J. Gladney for authority to sell and E. E. LaRue to buy, at the price of $4,000, the Winfield Telephone Exchange, of Winfield, Mo.

August 27: Case No. 476; order granting permission to the Citizens Telephone Co., of Tipton, Mo., to sell, and S. P. Adair to buy, for $269, the Fortuna Exchange, at Fortuna, Mo.

September 3: Case No. 485; order granting permission to the Rush Hill-Martinsburg Exchange to sell, and David L. Blanchfield to buy the Rush Hill-Martinsburgh system.

NEBRASKA.

August: Application by the Lincoln Telephone & Telegraph Co. for an increase of 50 cents per month in rates for telephone service at Hebron, Neb.

September 1: Order rescinding an increase in rates allowed the Lincoln Telephone & Telegraph Co. at Ashland, Neb.

NEW YORK.

September 22: Hearing to be held in New York respecting the metropolitan rates and appraisal of the property of the New York Telephone Co.

OHIO.

September 2: Answer by The Valley Telephone Co., of Wilmot, Ohio, to the complaint of residents of Waynesville, denying that its facilities are inadequate, the service insufficient or its rates excessive.

September 16: Postponed hearing at the request of the Central Union Telephone Co. on the company's protest on the valuation of its Lancaster property as fixed by the commission. The complaint arose out of the complaint of the city of Lancaster against the increased business rates established by the telephone company, effective on July 1.

OKLAHOMA.

September 8: Hearing on the application of the Pioneer Telephone & Telegraph Co. to increase rates in Oklahoma City.

September 8: Hearing on proposed order to all telephone and telegraph companies concerning routing of messages.

September 8: Hearing on proposed order to all telephone companies, embodying instructions relative to operating expense accounts.

September 8: Hearing in case of Enterprise Telephone Co. of Edmond vs. Pioneer Telephone & Telegraph Co., protesting against discontinuance of switching service.

September 8: Hearing in case of Morton Telephone Co., of Edmond, vs. Pioneer Telephone & Telegraph Co., protesting against discontinuance of switching service.

September 8: Hearing in case of Hackberry Telephone Co., of Arnett, vs. Arnett Telephone Co., for adjustment of switching charges.

September 8: Hearing respecting information from J. F. Lamison of Medford vs. Jefferson Rural Telephone Co., for alleged violation order No. 624.

PENNSYLVANIA.

September 2: Approval of the contract between the Bell Telephone Co. of Pennsylvania and the borough of Highspire.

WISCONSIN.

August 31: Order apportioning the toll earnings of the Mineral Point Telephone Co. and the New Union Telephone Co. on a 35 per cent. and 65 per cent. basis. The New Union company operates between Dodgeville and Mineral Point and a physical connection between the plants has been made.

September 7: Order requiring physical connection at Darlington, Wis., between the toll lines of the Wisconsin Telephone Co. and the Darlington exchange owned and operated by the three petitioners in the case—the Belmont & Pleasant View Telephone Co., and Lafayette & Iowa County Telephone Co., and the Willow Springs Telephone Co. An intervening petition by the Lafayette Telephone Co., which operates the exchange in Darlington formerly operated by the Wisconsin Telephone Co., asking the commission to investigate service, rates and regulations of all companies in Darlington and vicinity, and make them uniform, was dismissed. The complaint of petitioners against the White Oak Telephone Co. was dismissed as was a petition for physical connection with the Lafayette County Telephone Co., except that the latter shall permit the use of its switchboard for physical connection between the petitioners and the Wisconsin Telephone Co.

September 3: The Nebagamon Telephone Co., of Nebagamon, Wis., ordered to reconstruct its line and maintain its service in better condition. The commission investigated the service upon its own motion.

September 15: Hearing at Madison on the application of the West Menasha Telephone Co., of Menasha, Wis., for authority to increase rates.

September 16: Hearing at Madison on the application of the Glidden Telephone Co., of Glidden, Wis., for authority to increase rates.

September 16: Hearing at Madison in the case of A. J. Edminster & Co. et al. vs. the Chippewa County Telephone Co., Cornell Telephone Co., of Cornell, Wis., and the Wisconsin Telephone Co.

September 17: Hearing at Madison in the case of Arthur V. de Neven vs. the Wisconsin Telephone Co. and the Farmers Telephone Co., of Wyocena.

Practical Subjects—Letters and Discussions

A Hard Case of Trouble.

"What is the worst case of trouble you ever tackled?" a helper inquired of his foreman.

"I don't know off-hand" was the reply, "but there are two which always come to mind whenever a question like that comes up. I was detailed to install some additional equipment in a one-position board, common battery with lamp signals. It was an old board and only in fair condition so our progress was slow.

"As I was finishing the work on the key shelf, I told my helper to cut in the coils, which were located at the back of the board. The form had been pulled apart so he found it difficult to locate the proper pairs of wires. He was perfectly familiar with the wiring and knew how to test for the pairs. Suddenly I heard a slight click and the lamps went out.

"'Fuse, Bill,' I said, and went on with my work.

"'The fuses are all right,' he reported, after a short interval. 'Better come and take a squint.'

"Sure enough the fuses were O. K.

"'Well, what did you do back here?' I asked.

"'I dropped my screwdriver across the buss-bar like this,' he replied, 'and it made a spark. It don't spark now.'

"A test showed there was no battery on the board except the operator's transmitter battery. At the poles of the batteries, the current was O. K., but at the power lugs to which the cells were connected by No. 16 wire, there was no sign of battery. It did not seem possible that one of the leads could be open, but that was what the test showed.

"The operator kept shaking the board and, upon inquiry, explained that this trouble had occurred many times in the past. She stated that generally she cleared it by jarring the board before a repairman arrived. That looked to me like a loose connection. The soldered connections at the lugs appeared to be perfect—a slight over-dose of solder, but that was all. It occurred to me that there might be a splice, flaw or break in one of the leads and I decided to change the one that appeared open.

"I took hold of the lead with my pliers and Bill called: 'There they are! Now they are gone again,' he added in the same breath.

"I tried the same trick again but the lights did not come up. As only an inch of the lead was exposed, I knew I had not moved it enough to affect a loose connection in the form. The trouble must be at the lug—one side or the other. The wires from the back end of the lugs went direct to the fuse blocks but the connections there were in good shape also.

"A temporary lead to the battery was the next resort. I took the soldering iron and touched the lug to remove the old lead. The iron picked up every bit of solder on the lug, leaving as nice a coating of resin as anyone would care to see. A minute more and the trouble was cleared, never to come back again."

"How do you account for it?" the helper inquired.

"Well, I think it was like this: It was a resin connection from the start with a very slight solder mixture. Putting a short across the bus-bar fused the little solder that was holding. It had me 'going' for half an hour."

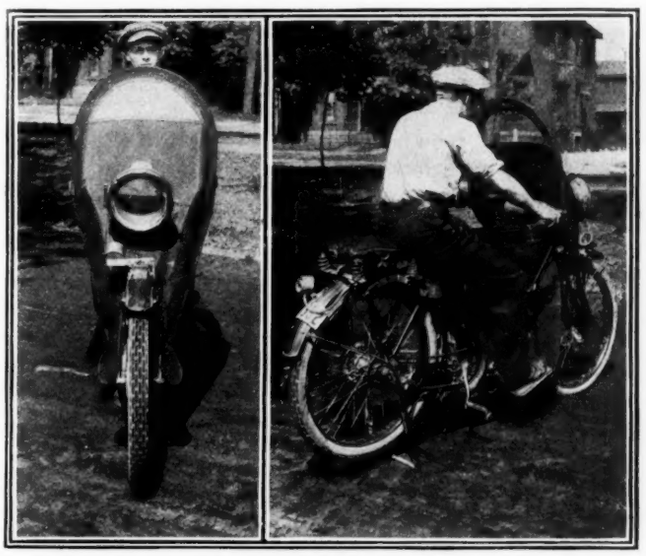
Chicago. P. H.

Telegraphy and Telephony Committee of A. I. E. E.

The telegraphy and telephony committee of the American Institute of Electrical Engineers, as reported in the September Proceedings of that organization, is composed as follows: C. E. Scribner, chairman, 463 West Street, New York City; C. L. Fortescue, H. M. Friendly, A. H. Griswold, F. B. Jewett, S. M. Kinter, Jr., William Maver, Jr., K. B. Miller, H. Mouradian, W. O. Pennell, J. B. Taylor and J. L. Wayne.

Windshield and Mud Guard for Motorcycles.

Trouble shooters who use motorcycles will be especially interested in the accompanying illustrations of a windshield and a mud guard for use on these machines. The windshield for



Motorcycle Comfort Device for Cold Weather.

motorcycles is made of hollow steel tubing and mohair cloth, the same as are used in the manufacture of automobile tops. The slope of the shield has been so calculated that even when the rider is looking out over the top the wind is shot up still higher and clears his head by a comfortable margin.

The device can be attached to any motorcycle in less than five minutes and adds but nine pounds to the gross weight. Apparently it adds no strain to the wrists in steering the machine. The use of this shield will doubtless render the use of the machine more feasible in winter and will be welcomed by all who ride the motorcycle. The mud guard shown in the illustrations is designed to keep the trousers clean and also protects the engine from mud and cold air.

Co-Operative Meetings for Exchange Employes.

A plan for fostering among exchange employes the spirit of continuous co-operative effort has been put into practice by G. W. Van Stone, manager of the Dunkirk exchange of the Federal Telephone & Telegraph Co., and is outlined in a recent issue of the Bulletin issued by that company. The plan is that of having a get-together meeting of all employes of the exchange every other Wednesday afternoon, the gatherings partaking of the nature of a convention at which subjects connected with the work of the exchange are freely discussed by those who have ideas to offer. This meeting is followed by a social session. Supplementing these meetings a monthly gathering of a purely social nature is to be held.

The meetings at Dunkirk were patterened after the Monday Noon Meetings held by the officials of the Federal company, and evidently are intended to make available to the employes of the local exchange a similar opportunity, at regular intervals, to benefit by an exchange of methods,

experiences, and plans for future united and effective effort. As an illustration of what is done, Mr. Van Stone describes the last meeting as follows:

"The meeting was held in my office with the office employes, the construction men and the majority of the operators in attendance. The business discussions were first brought up, then followed refreshments and a social session. On this particular occasion we started the get-to-gether hour with the taking of a photograph.

I, as chairman of the meeting, was first to speak. We had recently received some compliments on the service and I congratulated the operators for this good work. A motion was made to hold a party for the employes of our exchange once a month. The idea was unanimously adopted and it was decided that the first party will be held during the month of September at my residence. The employes have volunteered to take their turn in being host or hostess, as the case may be.

After my few remarks, Miss Graas, the chief operator, spoke of the good points in operating that she had gained at the telephone convention recently held at Jamestown. Mr. Willman, our wire chief, spoke of the work he is doing and incidentally mentioned an amusing incident that recently happened to him. He received a call from an out-of-town exchange; the party at the other end of the wire was complaining of some trouble on a toll line. When the party finished talking of the poor line, Mr. Willman asked him whom he thought he was talking to, and was informed that he believed he was in conversation with the Bell telephone wire chief.

Mr. O'Hargan, who was also present at the meeting, gave a short discussion on getting additional long distance business in Dunkirk. Mr. Papierski, the solicitor, brought up his methods of securing new business.

After the business has been completed, refreshments were served and an enjoyable social chat followed. Smiles and pleasant words were in abundance and all present agreed that the meeting had created a better feeling among them all, to say nothing of the benefits derived from the discussion pertaining to their work."

The Telephone in the Oil Industry.

The Standard Oil Co. of California, which operates 1,000 miles of trunk and gathering pipe lines in the state of California, owes much of its success in pipe line operation to the telephone. The company recently made the announcement that wherever it has an oil line it has its own telephone and telegraph wires, having found this as essential a proposition as that of employing line walkers.

Telephone and telegraph wires found their way into this field ahead of automobiles, which, according to the company's recent interesting statement, are now to be seen at every pump station, ro matter how remote. These are owned as a rule by employes, who have found them a most suitable vehicle for their trade, but still somewhat slower than the telephone in case of serious accident when quick communication with nearby stations and towns is necessary.

The San Joaquin Valley trunk line of the company is perhaps the most famous oil pipe line in the world. It is the one line that is known outside of the petroleum world, at any rate, and the telephone plays an important part in its maintenance. It connects the San Joaquin Valley oil fields with the San Pablo tank farm, which is a matter of 10 miles from San Francisco Bay, and is exactly 280.8 miles in length, being the company's longest line. It has the greatest carrying capacity, and at present is handling the bulk of that part of California's crude oil output which is produced or purchased by the Standard Oil Co.

The line has countless tributaries which carry oil from other fields. The successful operation of these lines, large portions of which intersect desert land, depends largely upon the facilities for discovering and repairing leaks. This is where the line walker and the telephone and telegraph play their part. The San Joaquin Valley line passes through isolated sections. Concerning the line walker and the telephone and telegraph the company has this to say:

A frequent visitor at the pump stations in time gone by came mounted, and had a sawed-off shovel strapped to his saddle. Among other things in his saddlebag were a hammer and caulking chisel. He rode the line. The saddle horse is no longer used in patrolling the line. It has been replaced by the driven animal, hitched to a light rig, which enables the line walker to carry a better equipment of tools. Owing to the character of the country, some sections of the line are patrolled by men who travel on foot. Every foot of the company line is patrolled. On the lookout for leaks the line walker travels back and forth over that section of the line for which he is responsible, usually about 30 miles.

If patrolling on foot, instead of repair tools he carries a pair of climbing irons and a telephone instrument. Wherever the company has an oil line it also has its own telephone and telegraph wires, and communication between stations is but the matter of a moment. When a line walker discovers a certain unmistakable discoloration of the ground in the vicinity of the line he investigates to learn the nature of the leak, and if it is of such a character that he cannot repair it, he immediately climbs the handiest pole, and reports to the nearest station. In a very brief space of time men with the necessary tools and material are on their way to do the repair work.

Importance of Fire Prevention During War.

The fire prevention committee of Chicago is calling attention of business interests to a recent article in the Chicago Herald as to the necessity of special precaution in regard to fires at this particular time. This is being urged by fire insurance men who declare that conflagrations of any magnitude, under the present financial conditions due to the European war, might upset the delicate fabric of financial and insurance credit. It would be necessary for the companies to sell large amounts of securities to pay a large loss, and with the stock exchanges closed this would be impossible. In appreciation of this situation Marshall Field & Co. has instructed the heads of all departments and managers of all factories, warehouses, garages and other properties, to be exceptionally careful at this time as to fire hazards. After citing the foregoing reason for special care at this time the manager of the insurance department of the company said, in a notice to employes:

"It is the duty of every assured, be he a householder or an employe, to take every wise precaution to prevent fire and its dire results at all times, particularly so at the present time. Consequently we call upon every employe in every department in all parts of our business to be more than watchful and careful in this regard, and every department head will be expected to make this a personal matter with those under him, to see that this is carried out.

"A loss of a property now not only means a money loss of the property but a loss of a plant, which at the present time will be most desirable to have in service, not alone for the good of the house but for the welfare of the employes themselves. Let everyone read this notice carefully, and let the wisdom of it impress itself upon him or her as the case may be."

Special Service for Physicians.

The Sullivan Telephone Co., of Sullivan, Ind., has made an arrangement with the local physicians whereby the doctors keep the exchange posted as to their movements. The system has been in operation only a few days, but is expected to prove its value in the first emergency.

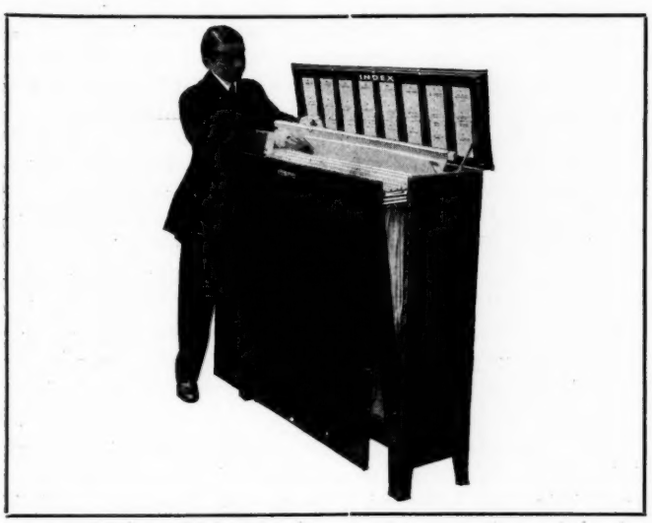
From Factory and Salesroom

Convention: Indiana Independent Telephone Association, Indianapolis, Sept. 16, 17

A Fine Container for Blue Prints and Tracings.

The problem of engineer and draftsman today is not so much indicated by the question, "Where is that Blue Print?" as by the one, "In what condition will it be a year from now?"

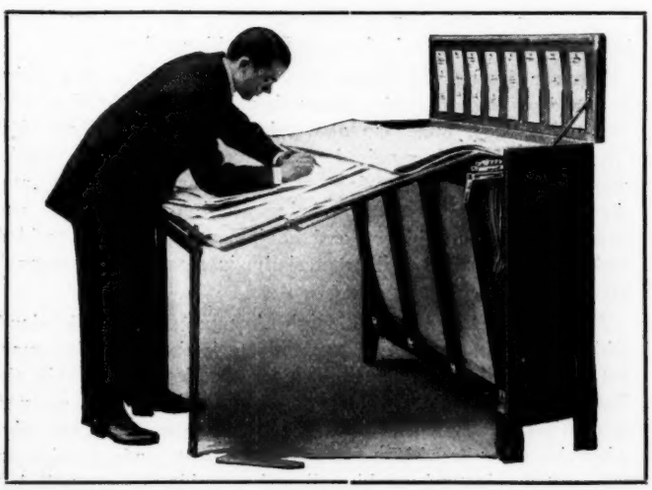
A container, or rather a combination protective container and automatic filing device, has been patented by the Yawman & Erbe Mfg. Co., of Rochester, N. Y., as a solution of this problem, and this file will no doubt prove of great interest and value to telephone engineers.



Mammoth Vertical File Partially Open.

This "Mammoth Vertical File," as the company terms it, occupies when closed, only 4 sq. ft. of floor space, yet it will accommodate from 700 to 1,000 prints.

The accompanying illustrations show the file as opened to remove a print, and with the front of the cabinet set for reference work. In the first illustration may be noted the compact appearance of the contents. The construction is such that all dust is kept out of the cabinet when closed. The prints are hung vertically in strong manila envelopes and each envelope is numbered. The inside of the cover is arranged with an alphabetical index which, when properly filled out, gives a numerical reference to the location of the print or tracing in its particular folder or envelope.



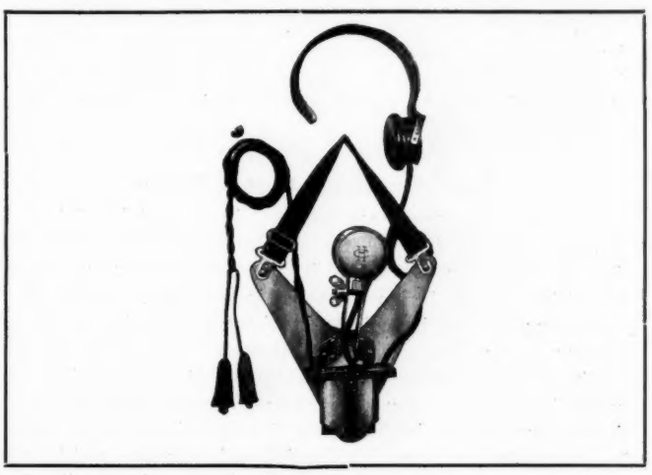
Mammoth Vertical File with Front Extended.

Should it be desired to work on the prints where the workman has, at the end of his fingers, other prints for reference work, it is necessary simply to open up the front of the cabinet. By doing this two supports drop into position, at the same time pushing up two small plugs at the bottom of the now reference table, to prevent the prints from sliding off to the floor.

Altogether this "Y & E" Mammoth Vertical appears to have the practical and economical side of the blue print file question solved. Yawman & Erbe Mfg. Co. has prepared a descriptive booklet on the subject, entitled "The Proper Place for Blue Prints and Drawings," which may be had upon application to the company.

A Breast Telephone Testing Set.

A breast plate telephone testing set which was developed to meet the requirements of the United States navy and shipbuilding corporations which construct battleships, is shown in the accompanying illustration. It will commend itself for use in general work. The battery is contained within the set so that it does not become necessary to carry it around in the hand or to employ one hand to hold the box or keep it from tipping over. Both hands are thus left free for making test connections and tagging the wires.



Breast Telephone Testing Set.

Unlike the method of testing with a box containing two or three dry batteries and a vibrating bell or buzzer, it is possible with the breast plate testing set to be in immediate communication with the party at the other end as soon as the lead under test has been picked up. This is a great time saver.

The set is made practically indestructible, the breast plate, battery holder and transmitter all being made of sheet brass and unbreakable. The battery holder is simple and is arranged to take a flashlight battery, which is easily procurable. The receiver is a standard head band type, with outer shell of hard rubber and inner shell of metal. Provision is made for taking the strain off of the connections on the receiver cord and testing leads.

A pair of rubber covered test clips are provided at the ends of 4-foot testing leads as shown in the illustration. The connections are very simple, the transmitter, receiver, battery and testing leads all being in series. Since the battery is used only when the circuit is actually closed, it

will last for a very long period. Furthermore a very weak battery that would not be serviceable for operating a flashlight or bell will be found to operate the telephone set satisfactorily. The set complete weighs 1½ pounds. It is manufactured by the Holtzen-Cabot Electric Co., of Boston and Chicago.

Valentine-Clark Co. Tripling Open Tank Facilities.

The Valentine-Clark Co., of Minneapolis, Minn., is tripling the capacity of its open-tank system of butt-treatment of cedar poles at Minnesota Transfer (St. Paul). The company is a pioneer in the open-tank method of preserving cedar poles, and after seven years of development with this method is convinced that cedar poles properly butt-treated eliminate the necessity of substitutes such as steel and concrete. The company claims that leading engineers throughout the country have endorsed properly butt-treated cedar poles as the safest construction for high-tension transmission work. The company carries large stocks in all of its yards, and its officers give every detail of pole production and treating personal attention, insuring the ultimate of satisfaction to its customers. Minnesota Transfer is one of the most advantageous distributing points in the country.

New Bulletin of Rebuilt Telephone Equipment Co.

The Rebuilt Telephone Equipment Co., 2127-2129 West 21st Street, Chicago, now has on the press a new comprehensive 52-page bulletin to be known as Bulletin No. 6. An advance copy of the general index of this bulletin shows that 57 different entries, covering practically the whole field of telephone equipment, have been made. This valuable bulletin will be sent to any telephone company upon request.

Condition of the Copper Market.

It is not surprising, says Copper Gossip, published by The National Conduit & Cable Co., 41 Park Row, New York City, that the new situation created by the European war now being waged has greatly lessened activity in the copper market. Foreign complications have brought about a cessation of copper exports, and as Europe was a customer for about 60 per cent. of the United States output, the interruption of foreign shipments is of serious consequence to producing interests. With the elimination of the European demand there is naturally a larger surplus of copper on hand in this country, and because of the loss of foreign outlets and the increase in supplies here the market for electrolytic wire bars declined to 12½@12¾ cents per pound.

There are no indications, however, that home consumption has been checked on account of the war in Europe. On the contrary, domestic brass and copper mills appear to be doing more rather than less since the outbreak of hostilities abroad. The direct effect of the war has been curtailment in production at many leading properties. In some cases a heavy reduction in monthly output will be effected, and a radical policy of retrenchment at important mines may be expected so long as the European situation makes restriction necessary. The sudden shutting off of European demand will be a potent factor in the future developments of the copper market. But with a proper regulation of production by the big United States properties the market situation will be prepared to avoid many unnecessary sacrifices.

Publication of copper statistics by the producers' association has been suspended indefinitely on account of conditions arising out of the European crisis. The July figures were therefore withheld, but notwithstanding large exports during the past month it is reasonable to assume that a further substantial increase to United States stocks occured. Nevertheless, the position should be capable of good control, and in spite of the upheaval among European nations everything should be done to increase the consumption of copper in this country. With raw copper at a very reasonable market level there should be a determined movement to stimulate a greater domestic demand for the products of our manufacturing plants.

Death of Thomas E. Hughes.

Thomas E. Hughes, manager of the Philadelphia office of the Standard Underground Cable Co., died recently at his residence, Atlantic City, N. J., Mr. Hughes had long represented the Standard company throughout its Atlantic Coast territory from Philadelphia south, and for the past 17 years had been manager of its Eastern and Southeastern branch office sales department located at Philadelphia. During the period of his association with the company he had seen the number of its branch offices increase more than five-fold, and the annual business done in the Philadelphia office territory during recent years grow to a figure equal to that of the company at large seventeen years earlier.

Mr. Hughes has been a well known figure in the electrical field practically from its commercial inception and a host of friends among his customers and associates will not soon forget his unusual personality with its large capacity for friendship and its unusual mental aggressiveness which was his to the end.

For a number of years, Mr. Hughes was secretary and director of the Manufacturers' Club, Philadelphia, and active and influential in securing its present location. Until his death he took a great interest in the club's activities.

Prior to his connection with the Standard company, Mr. Hughes was connected with John A. Roebling Sons Co., at Trenton, N. J., and Scranton, Pa., and with the Washburn & Moen Manufacturing Co., at Worcester, Mass., and at Pittsburgh, Pa.

Paragraphs.

Rome Wire Co., of Rome, N. Y., has sent out to its patrons a neat September calendar.

Palmer-Moore Co., Syracuse, N. Y., manufacturer of the Palmer-Moore line of motor trucks, is mailing to its friends a handsome postal card souvenir from the Palmer-Moore booth at the New York State Fair exhibit at Syracuse.

Detroit Insulated Wire Co., Detroit, Mich., is erecting a new building of steel construction, 57x138 ft. in size, with saw-tooth roof, and also a wood working unit 35x50 feet. The new building is required to provide space for more equipment, and the general offices of the company will be located therein, the present quarters being required for factory use. The additional machinery and equipment has been provided, and when installed will materially increase the company's production.

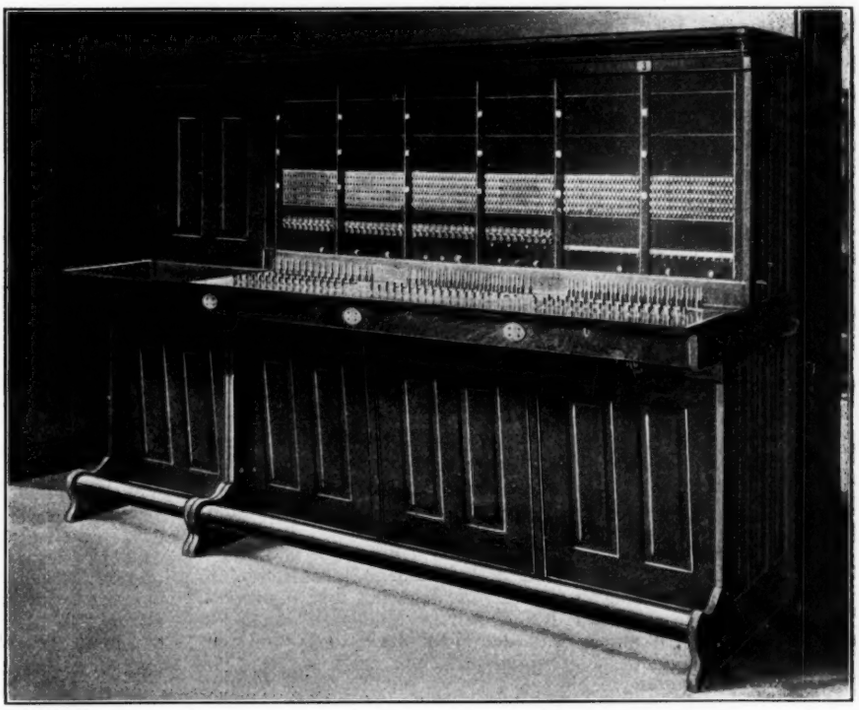
R. S. Mueller, 423-425 High Avenue, S. E., Cleveland, Ohio, is sending out the Cleveland stock sheet showing magnet wire in Cleveland stock. Under the department "On the Road," appears another batch of good stories. "The meanest competitor I ever met," says R. S. M., "was the chap who, when he saw the village council was about ready to sign up my contract instead of his, slipped two bits to a small boy to run out and ring the fire bell."

Dielectric Mfg. Co., St. Louis, Mo., has published in booklet form, and is distributing "A Talk About Wood Preservation," by J. J. Kessler. This article is in support of the dipping of impregnating wood in coal tar as a method that is economical and almost equal to that secured at great expense by complete saturation under pressure. The booklet describes Phenoleum a heavy oil having a gravity of 1.05 and having

the desired qualities for a preservative for dipping and brushing purposes.

New Common Battery Switchboard for Jackson, Mo.

H. A. White, representative of the Kellogg Switchboard & Supply Co., at Kansas City, announces that the Cape Girardeau Bell Telephone Co., Independent, having exchanges also at St. Genevieve, Oak Ridge, St. Mary's and Jackson, has made arrangements to install at Jackson a full common battery multiple type switchboard. This board will be a three-position section with box panel and the installation includes relay rack, chief operator's and wire chief's desks and power plant. The present equipment is for 1,000 lines, with an ultimate capacity of 1,200 lines, multipled every four panels. This board will be of the well known Kellogg associated multiple type with universal cord circuits. It will be practically identical with the board shown in the accompanying illustration.



Type of Kellogg Switchboard to Be Installed at Jackson, Mo.

Another "1900" Dry Battery Record.

Apropos of the controversy respecting the life of dry batteries, the Nungesser Carbon & Battery Co., of Cleveland, Ohio, submits a letter received in February last from C. A. Fobes, of the Sleepy Eye Telephone Co., Sleepy Eye, Minn., in which he stated that on February 26 he replaced some "1900" dry cells, more because he expected to leave the employ of the company than for reasons of service then given by the cells. The subscriber in question was reluctant to have the change made, as he said the service was all right and he frequently used the telephone in talking to St. Paul, and had no trouble with it over this distance of over 90 miles. These cells were dated October 9, 1905, showing a service of 8 years, 4 months and 15 days. When taken out they still produced a good click in a receiver connected across the terminals.

September.

The oysters now "R" on the shell,
The chickens in the coop,
The fish are in the frying pan,
And clams are in the soup.

While Europe broils, our thoughts must drift
To safe and saner themes,
Our business needs must get a lift
With advertising schemes.—Blakely Service.

Fire Alarm System at Springfield, Ill.

A new fire alarm system has been installed by the Central Union Telephone Co., at Springfield, Ill. Under the new system the fire department has two direct trunks from the telephone office and all calls of fire will be connected directly. Indicators are used in the engine houses, and it is stated that there will be a saving of a half minute on each call as compared with the old system.

Telephone Statistics in Michigan.

Recent figures compiled by C. B. Hall, chief of the telephone division of the Michigan Railroad Commission, show that the telephone development in the state of Michigan is 116 telephones for every 1,000 of population. In a statement previously published erroneous figures were given.

Some Dry Battery Records in Kansas.

M. C. Wilson, superintendent of the Clay Center Telephone Co., of Clay Center, Kan., in referring to a recent communication in TELEPHONY regarding long dry battery service, says that this recalls some incidents in his own experience regarding length of time dry cells may remain in service. He says:

"E. Stine installed a set of 'Liberty' batteries in a telephone on March 15, 1906, and they were renewed on June 2, 1914, a life of eight years, two months and 17 days. This was in a private residence. Within the last six months we have taken out three sets of batteries each with an equally long record, one set in a clothing store having a longer life than the one given above, but did not preserve exact figures. The Liberty battery is no longer manufactured."

Telephones in Merrie England.

Not long ago somebody of prominence in the city of Liverpool protested loudly against the government's operation of telephones, making particular objection against the time taken to install a new telephone. But it seems that the Liverpool man was rather impatient, says the New York Commercial.

"The average time taken to connect the new subscriber with the telephone system," says the postmaster general, "from the time of receiving the order is as follows: Birmingham, 51 days; Manchester, 40; Belfast, 40; Liverpool, 26; Dublin, 21½; London, 18½, and Edinburgh, 18."

Who wouldn't live in Merrie England, in Birmingham, for instance, and have the pleasure of ordering a telephone installed in one's business house, say on April 15, and then one's eyes cheered on June 5 with the sight of the installation man coming through the front door with his two or three civil service, politically-cinched assistants?

Here in this country we live too fast. We notify the telephone company we want a telephone, and if we haven't got it in two days we begin to worry the manager. If it isn't in place by the third day the chairman of the board of directors is liable to hear from us.

The postmaster general of Great Britain and Ireland neglected to say how long after a connection is made service begins. Probably one doesn't have to wait more than a week or two before the central operator deigns to answer.

Condensed News Reports

Officers of Companies are Earnestly Requested to Forward Us Promptly All Financial and Other Statements as Soon as Issued and Any Items of Interest as to Their Plants and Systems

Personal.

JOHN L. GROGAN, manager for the Southwestern Telegraph & Telephone Co., of Arkadelphia, Ark., has been transferred to Harianna.

JUDGE G. C. DIMM, of Holton, Kans., has resigned the managership of the American Independent Telephone Co. The directors of the company have not yet selected a successor to Mr. Dimm.

O. B. GOFFE, of Oklahoma City, Okla., has succeeded G. S. Harts, as manager of the Pioneer Telephone & Telegraph Co. at Ada, Okla. G. S. Harts, who has been manager at Ada for about a year, has been transferred to Hugo, Okla.

ALFRED N. SAMPSON has been appointed commercial representative of the New England Telephone & Telegraph Co., at Somerville, Mass. Mr. Sampson has been connected with the commercial department of the company for several years.

E. L. KEPLER, who for the past two years has been secretary-treasurer of the Mississippi Valley Gas Co., at St. Louis, has been appointed general superintendent of the Texas Independent Telephone System, at Waco, Texas, succeeding to the duties of P. Kerr Higgins, who has resigned as general manager of the company. Mr. Kepler has been prominently connected with Independent telephone companies in Missouri and Wisconsin for the past 15 years.

FRANK F. FOWLE has closed his New York office at 68 Maiden Lane and removed his headquarters to Chicago, his duties as one of the receivers of the Central Union Telephone Co. now occupying his entire time. Mr. Fowle does not intend to retire from the consulting engineering field, but just at present, owing to his receivership duties, will be unable to engage in outside matters of any magnitude. The receivers of the Central Union company have established their own separate organization, occupying exclusive quarters on the tenth floor of the Telephone Building, Chicago.

P. KERR HIGGINS has resigned as general manager of the Texas Independent Telephone System, of Waco, Texas. This action was taken some time ago but Mr. Higgins consented to remain with the Texas properties until some arrangement could be made by the company to fill the vacancy. He will be succeeded by E. L. Kepler, who becomes connected with the company with the title of general superintendent. The announcement of Mr. Higgins' resignation is made coincident with its reluctant acceptance by the board of directors. Mr. Higgins, who has been general manager of the Texas Independent Telephone System since March, 1913, and who is one of the best known and most capable all around telephone men in the business, has lately had several more lucrative offers in other fields and finally decided that his better opportunities lie elsewhere.

Mr. Higgins was manager of the San Antonio Telephone Co. when that company was purchased by the Brazos Valley company in February, 1913. He became general superintendent for the Brazos Valley system in March of the same year, and two months later was made general manager. Prior to this he was connected with the Pioneer Telephone & Telegraph Co., at Oklahoma City, Okla. He is one of the pioneers in the telephone business, having been engaged therein since September, 1881.

Messrs. Earle and Hyde, chief owners of the Texas Independent Telephone System, have presented Mr. Higgins with a handsome gold watch, suitably engraved, in recognition of his valuable and loyal services during his connection with the company. Under his capable management of the properties, many reforms have been inaugurated in the business, a large amount of construction work has been carried through and the properties throughout have been much improved. He has materially increased the number of subscribers over the system and has put the business on a thoroughly systematic operating basis, adding to the efficiency of the many employes and benefiting the patrons through improved service.

Mr. Higgins will remain in Waco for several weeks to acquaint Mr. Kepler with the affairs of the telephone properties.

Obituary.

CHARLES D. BIGLEY, aged 55 years, local manager for the Wisconsin Telephone Co., of Oconomowoc, Wis., for the past 18 years, died suddenly of heart failure. Mr. Bigley was with the telephone company for 23 years.

New Companies.

VANDALIA, ILL.—The Peoples Home Telephone Co. has filed articles of incorporation with $22,700 capital stock, and will operate a telephone system in Fayette county, Ill. The officers are John U. Metzger, H. L. Haines and D. B. Barr.

BURR OAK, IOWA.—The Burr Oak Telephone Co. of Wilton was recently incorporated with the following officers: W. M. Brammeier, president; William Herr, vice-president; J. W. Brammeier, treasurer; and E. C. Nienabor, secretary.

BELGRADE, MONT.—The Springhill Telephone Co. has been organized. Its capital stock is $1,000. The incorporators are A. E. Crainer, J. A. Forswall and J. C. Miller, all of Belgrade.

MASON, TENN.—Articles of incorporation has been filed by the Mason Telephone Co., the capital stock of the company being $2,000. The incorporators are as follows: John T. Karney, Newton H. Sanders, Dr. Fenton L. Husbands and Postmaster George W. Marsh of Mason, and Perry O. Wilkerson of Stanton.

Construction.

HANFORD, CALIF.—The Pacific Telephone & Telegraph Co. has commenced making improvements to its local system that will cost about $5,000.

STOCKTON, CAL.—The Pacific Telephone & Telegraph Co. has approved the expenditure of $3,300 for the reconstruction of pole lines and installation of underground cable. The completion of this work will provide adequate facilities in the northeastern portion of Stockton. The large development during the first of this year has necessitated the increase of the company's plant.

MARSHALLVILLE, GA.—The Marshallville Telephone Exchange, J. O. Persons, manager, contemplates making improvements to its exchange. The system will be changed from grounded to metallic circuit and will require about three miles of cable. A new switchboard will also be installed.

MARYVILLE, MO.—The work of building a new telephone line from Maryville to Graham probably will start soon.

GREAT NECK, N. Y.—The New York Telephone Co. is spending between $25,000 and $30,000 in improving its service in this place. It is changing from the magneto to common battery.

Underground.

VICTORIA, B. C., CAN.—The American consul reports that the Pacific Cable Board has decided to lay a second cable from Bamfield, the cable station on the west coast of Vancouver Island, to Port Alberni, and an underground cable from Port Alberni to Parksville. A submarine cable will extend from Parksville to Nanaimo, to connect with the cable from Nanaimo to Vancouver, British Columbia. The cost of this work will be about $75,000.

Elections.

COLLINSVILLE, CONN.—The annual meeting of the stockholders of the Farmington Valley Telephone Co. was held recently. The following directors were elected to serve for the ensuing year: C. E. Jones and R. G. Foster of New Hartford; H. C. Knight and E. B. Baker, of New Haven, and others. The officers are: R. G. Foster, president; D. T. Dyer, vice-president, and W. H. Sullivan, secretary and treasurer.

NEW WASHINGTON, IND.—The New Washington Telephone Co., which was recently incorporated, has elected officers as follows: Henry F. Schowe, president; Albert R. Miles, vice-president; Charles C. Bottorff, treasurer, and Thomas R. Stevens, secretary.

HIGHMORE, S. D.—The Hyde County Telephone Co., owned and operated by A. N. Van Camp, held its recent annual election and elected the following officers: Dr. I. M. Burnside, president; A. N. Van Camp, secretary and treasurer; and S. Drew, Henry Quirk and Allen A. Van Camp, directors.

Financial.

HAMBURG, WIS.—The Hamburg Telephone Co. has increased its capital stock from $3,000 to $6,000. The money will be used for extensions and betterments. The officers are: Robt. Kleinschmidt, president; and Herman Krenz, secretary; both of Hamburg.